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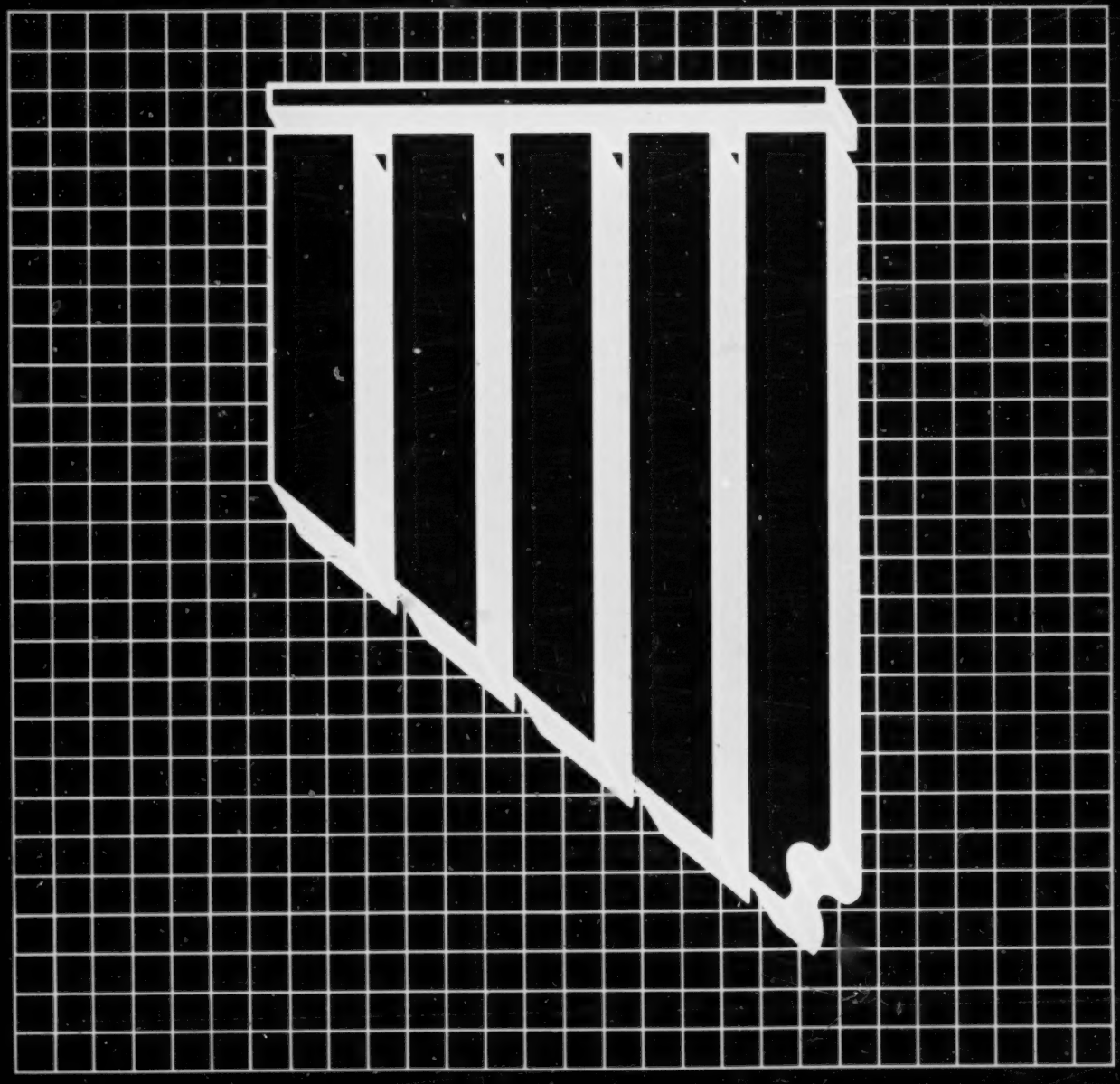

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General Editorial Policy

The *Nevada Review of Business and Economics* is currently a bi-annual publication of the Bureau of Business and Economic Research, College of Business Administration, University of Nevada, Reno. Articles published in the *Review* are refereed. The *Review* seeks to publish articles that focus on the business and economic environment of Nevada and the Western Region of the United States. Papers that focus on national or international topics will also be considered for publication if they either relate the topic to business and economic concerns of the Western Region or deal with a topic of sufficient interest to the Western Region. Papers can be nonquantitative or quantitative; however, in both cases, papers should focus on policy issues regarding the business and economic environment. In the case of quantitative papers, technical discussions should not be the focal point of the paper. In those cases where technical discusssions are necessary, they may be more appropriately relegated to a technical appendix. The editorial policy of the *Review* is designed to reflect the interests of its readership which consists primarily of professionals in the business community, government officials and policymakers, and academics in Nevada and the Western Region of the United States. All manuscripts should be addressed to:

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PREFACE

The Winter 1990/1991 issue of the *Nevada Review of Business and Economics* consists of three parts. The first part consists of three articles, each of which focuses on a topic of interest to Nevada.

The article by Kambiz Raffiee, Jeane Wendel and Tim Hopkins on hospital cost analysis presents a detailed statistical study of those factors that account for the variation of hospital costs among counties, states and regions of the country.

The article by Jack H. Rubens summarizes the thrift crisis, then proceeds to present an analysis of the degree to which there are differences in operating performance of savings and loan associations within the eleventh district of the Federal Home Loan Bank System. Additionally, Rubens presents information on Nevada S&Ls which indicates that, as a group, they have performed better and have resorted to less risky sources of funds than other S&Ls considered.

The paper by David A. Lewis compares leadership styles in Greece, Puerto Rico, and Taiwan. The differing leadership styles are something that Nevada businesses should consider as they reach out beyond the country for new markets and/or try to attract foreign trade into Nevada.

The second part of the *Review* consists of an overview of the Nevada and U.S. economies, addressing questions of state and national interest. Are we in a recession? What is a recession and what is a business cycle? How might a national recession impact Nevada?

The third part of the *Review* consists of detailed economic indicators that focus on the nation, western region, and the state of Nevada.

The inside back cover of the *Review* presents information on the data sources and considerations that need to be taken into account in reviewing the tables and graphs.

The next issue of the *Nevada Review of Business and Economics* will be published in July 1991. It will present economic indicators for Nevada, its counties, and its major metropolitan areas.

Hospital Cost Analysis for Nevada

*by Kambiz Raffiee, Jeanne Wendel and Tim Hopkins**

Introduction

Available data from the American Hospital Association, Equicor, the Health Insurance Association of America, and the Health Care Financing Administration indicate that hospital care is costly in Nevada, compared with the national average. This evidence also indicates that hospital care costs vary considerably among counties, states and regions of the country. Identifying the factors that explain these high costs is important before cost containment proposals can be evaluated.

Previous studies have established a broad consensus that demographic, geographic and health system variables explain much of the inter-area differences in cost (although lively discussion continues about the precise causal mechanisms). (See, for example, Knickman and Foltz (1984) and Rothberg (1982).) This study uses regression analysis to address two related questions about Nevada's high hospital care costs: (a) can the high cost of health-care in Clark and Washoe Counties be explained by the factors that explain inter-area variations in cost nationwide, and (b) which characteristics can explain Clark and Washoe Counties' above average costs.

The study proceeds in four steps. First, published data on the relations between hospital costs in Nevada and average costs in the nation is reviewed. Second, regression models are developed to identify factors that explain the variations in cost per inpatient day (CPD) and cost per hospital admission (CPA) across all counties in the U.S. Third, the regression residuals are analyzed to determine whether the regression's independent variables account for the high costs experienced in Washoe and Clark Counties. Finally, the regression results are used to estimate the quantitative impact on local hospital costs of individual demographic and health system characteristics of Clark and Washoe Counties.

Nevada/U.S. Average Hospital Costs Compared

Four complementary sources of information are available to compare the cost of hospital care in Nevada with average hospital costs in the U.S. Summary statistics from each source are presented in Table I.

The American Hospital Association's (AHA) Annual Survey of Hospitals provides comprehensive data on total expenditures for all services provided by hospitals. The AHA computes cost per inpatient day (CPD) and cost per hospital admission (CPA) by dividing total hospital expenses by inpatient days and admissions, respectively. These data are reported for the 50 states and Washington, D.C. Cost rankings for CPD and CPA can differ because the average length of stay varies among states. Other things equal, a high CPD combined with a short average length of stay would result in a moderate CPA.

The 1987 AHA survey indicates that hospital costs in Nevada are greater than the national average, whether measured as CPD or CPA. CPD averaged $766 in Nevada, compared with $539 nationwide; only Alaska experienced a higher CPD. CPA is also high in Nevada, despite the fact that average length of stay (ALOS) is relatively low. ALOS in Nevada was 6.0 in 1987 compared with an average of 7.2 for the US overall. The Nevada CPA was $4,635, compared with the nationwide average of $3,850. Only three areas were more costly than Nevada in terms of CPA: Washington, D.C., Alaska, and California.

AHA survey information is used widely for interstate comparison of CPD and CPA. The mix of services included in the AHA cost data varies among hospitals because the mix depends on the types of patients treated, local medical practice patterns, and whether various specific services are provided directly by hospitals or by other types of health care providers. Consequently, interstate differences in AHA-reported costs may represent either different costs for comparable services or different services produced at comparable costs.

Equicor's annual survey of Hospital Daily Service Charges provides data on inpatient room and board charges plus ancillary charges. The survey for 1987 indicates that Nevada's average daily charge of $1,204 in 1987 was the highest in the nation, compared with a national average of $697. Nevada hospitals reported the second highest cost per stay, $6,624, compared with the national average of $4,551.

Nevada's high cost per stay is somewhat surprising since this survey indicates that average length of stay in Nevada is 5.5 days, which is below the national average of 6.5 days.

The Health Insurance Association of America (HIAA) survey focuses on typical charges for a semi-private acute care room. The average room rate charged by the respondents in Nevada was $233.01, which was below the national average of $252.38 (see Table 1). Twenty seven states experienced higher room charges than Nevada, according to this survey.

The apparent conflict with the Equicor data shown in Table 1 may stem from the following three differences between the two surveys. The Equicor survey asks hospitals to

*Kambiz Raffiee and Jeanne Wendel are associate professors, and Tim Hopkins is a graduate student, in the Department of Economics at the University of Nevada, Reno.

Table 1
Hospital and Health Care Costs:
Nevada Compared with the U.S. Average

Source	Cost Measure	Nevada Cost	U.S. Cost	Rank*
AHA 1987	Hospital CPD	$ 766	$ 539	2
	Hospital CPA	$4,635	$3,850	4
EQUICOR 1987	Avg. Room & Board	$305	$257	7
	Avg. Ancillary	$900	$439	1
	Charge per Day	$1,204	$697	1
	Charge per Stay	$6,624	$4,551	2
HIAA 1988	Room Charge (semi-private, acute care)	$ 233	$ 252	28
HCFA 1982	Personal Health Care Expenditures, Per Capita			
	Total Health Care	$1,380	$1,220	4
	Hospital Care	$ 630	$ 577	7

*Nevada's rank compared with high-cost states.

report on average room and board charges for all types of rooms, while the HIAA surveys focuses specifically on the semi-private room rate. Second, the two surveys do not include exactly the same hospitals. Third, the two surveys include different types of hospital units. This sensitivity of results to the details of the survey design underlines the need to understand precisely what types of costs are high before adopting policy prescriptions.

Table 2
Nevada's Hospital Care Cost
Compared with Other States*

Year	Nevada's Rank**	
	CPD	CPA
1978	4	12
1979	4	11
1980	4	6
1981	4	5
1982	3	4
1983	3	4
1984	2	4
1985	2	4
1986	2	4
1987	2	4

*AHA data
**Nevada's rank compared with high-cost states.

Earlier data from the federal Health Care Financing Administration (HCFA) on personal health care expenditures provide some additional perspective. Data is reported for total expenditures for personal health care as well as six components of health care spending, including hospital care. National averages were published annually for individual states for selected years from 1966 through 1982. Per capita expenditures for hospital care were $630 in Nevada in 1982, compared with $577 for the U.S. as a whole. In the same year, total per capita personal health care expenditures were $1,380 in Nevada, compared with the national average of $1,220. Nevada per capita expenditures in 1982 were above average for physician services, dental services, drugs and drug sundries, and below average for only two categories, nursing home care and other health services including professional services and eyeglasses.

Table 3
Nevada's Hospital Care Costs
Compared with U.S. Average*

Year	Per Capita Expenditures** Nevada	U.S. Average
1966	$ 68	$ 80
1969	108	119
1972	151	166
1976	273	276
1977	303	307
1978	348	339
1979	403	383
1980	540	441
1981	564	509
1982	630	577

*HCFA data
**Hospital Care

Historical data indicates that hospital care has been costly in Nevada for some time. The AHA survey data indicate that Nevada's position as a high cost state has been stable over the last decade, with Nevada consistently ranking among the four states with the highest CPD for the last ten years. For CPA, Nevada has been one of the six most expensive states for the past eight years. Prior to that year, this state was the eleventh most costly. The HCFA per capita expenditure data indicates that Nevada per capita hospital care expenditures have been above the U.S. average since 1978, and were below the national average from 1966-1977.

Model

Two approaches have been used to estimate the determinants of hospital costs: recent work has explored flexible form cost functions, while initial studies estimated reduced form

equations that incorporated factors affecting both supply and demand. Microeconomic theory hypothesizes that cost is determined by output quantities and by input prices. Several recent studies have used models with flexible functional forms to test hypotheses about the shape of the hospital cost function. (See Conrad and Strauss (1983) and Grannemann, Brown and Pauly (1986)). This approach is appropriate when firms produce a limited number of well-defined products.

Hospital output, in contrast, is heterogeneous in ways that are subtle and difficult to measure. The precise nature of hospital output depends on the facilities offered by the hospital, the mix of patients entering the hospital, and the quality of care provided. This approach recognizes that realized average cost results from the interaction of the cost and demand functions, and therefore estimates a reduced form equation with factors that affect supply and demand as explanatory variables. Such studies of hospital cost focus on identifying key hospital and patient characteristics that affect the overall level of cost and include a wide variety of explanatory variables that are hypothesized to affect cost. Since theory provides no guidance about the precise functional relationships between these variables and cost, the simple additive-linear form is generally used.

The reduced form approach is used here because it is appropriate for identifying local area characteristics that contribute to cost differentials. Because of the ad-hoc nature of the regression equation, however, the results of the study must be viewed as preliminary. This approach can be used to identify factors that are potentially significant for explaining cost variations; additional detailed study of these factors would be needed to understand the causal mechanisms by which they affect average cost.

Previous studies of this type indicate that regional and interstate differences in population, geographic, and health system characteristics can explain much of the variation in hospital costs. While general consensus has been reached that demographic and health system variables affect average hospital cost, researchers continue to discuss the precise nature of this influence and the most relevant way to measure some of these variables. (See Feldstein (1967), Blumberg and Gentry (1978), Pauly (1978), Trivedi (1978), Ault and Johnson (1979), Feldman and Greenberg (1981), Friedman and Pauly (1981), Rothberg (1982), Sankey, Kominski, Dowd and Soper (1984), Kelly (1984), Knickman and Foltz (1984), Eakin and Kniesner (1988)). The study described here builds on this previous work to develop national regression equations which are then used to identify the sources of high hospital costs in Clark and Washoe Counties.

The regression models utilize demographic, geographic, health system, and cost data for each of the 2,474 U.S. counties that contain at least one short-term general hospital. Short-term general hospitals accounted for 86 percent of total hospital expenditures in 1983; other types of hospitals are excluded to avoid this source of heterogeneity. The analysis is based on data from 1983, which immediately precedes the introduction of diagnostic related groups (DRG's) as the basis for Medicare reimbursement. (The DRG system was phased in beginning October 1983.) Thus, the disequilibrium adjustment period following the introduction of the new payment system was avoided.

Data to measure these characteristics was obtained from standard sources, such as the American Hospital Association, the County Hospital File, and the American Medical Association. The county, rather than the state, was used as the unit of observation in order to fully utilize information about the variability of CPD and CPA.

Separate regressions for CPA and CPD were developed in two stages. A preliminary regression equation was estimated for each dependent variable using the demographic, geographic, and health system variables that had been found to be significant determinants of cost by previous researchers. Variables found to be significant in each of these preliminary regressions were included in the final list of explanatory variables for each regression. Inter-county variations in cost are associated with demographic characteristics, hospital staffing patterns, hospital facilities and ownership, the availability of nursing home beds, teaching and research involvement, patient case-mix, wages, region of the country, and average length of stay. Variable definitions, means, and standard deviations are listed in Table 4 for the significant variables; additional variables that were found to be insignificant are listed in Note of the Table.

One variable is included that raises some questions about the linear specification used here. The number of personnel per inpatient day (or number of personnel per admission in the CPA regression) is included as an explanatory variable along with a variable measuring the local hospital wage level. It is possible that these two variables should enter the regression equation together as a product representing total wages paid. This would be appropriate if high ratios of personnel/patient simply represented either inefficient use of personnel or high standards of nursing care. However, as noted below in Section V, differences in the ratio of personnel/patients may be associated with differences in capital intensity, case mix, or vertical integration. In this case, the indirect effects of the personnel/patient ratio on cost may be substantial, and should be measured separately from the wage-related impacts. Of course, it would be preferable to measure the degree of capital intensity, case mix, or vertical integration directly, but accurate measurement of these variables lies beyond the scope of this paper.

Regression Results

The independent variables in the final regression equations explain 94 percent of the inter-county variation in CPD and 80 percent of the inter-county variation in CPA. The coefficients on specific independent variables differ, of course, between the two regressions. Some of the independent variables also differ between the CPD and CPA regressions, but the two lists of significant explanatory variables contain substantial overlap. Regression coefficients and standard errors for the CPD and CPA regressions are listed in

Table 4
Variables Used in the Regression of Cost per Inpatient Day (CPD); Cost per Admission (CPA); Definition, Mean, and Standard Deviation (S.D.); Short-Term General Hospitals (STGH) in 1983.[a]

		Mean	S.D.	WASHOE COUNTY	CLARK COUNTY
ENDOGENOUS VARIABLES					
CPD	Total reported STGH expenditures (1) divided by total STGH inpatient days (1).	351.8929	317.7399	642.0000	976.0000
CPA	Total reported STGH expenditures (1) divided by total STGH admissions(1).	2241.7713	756.2195	3211.0000	4062.0000
DEMOGRAPHIC VARIABLES					
GPOP	Population growth rate between 1970 and 1982 (2) and (11).	0.1904	0.2584	0.7206	0.8697
POPDEN	Population density in 1980 (12)	233.8169	1742.8043	30.0000	58.0000
PI	Per capita income in 1982 (2).	9277.0000	2043.0000	13740.0000	11652.0000
F	Female population in the age category of 15 to 29 in 1980 (6) divided by total population in 1980 (6).	0.1266	0.0203	0.1441	0.1379
MCA	Medicare admissions of STGH in 1982 (1) divided by total STGH admissions (1).	0.3595	0.1041	0.2445	0.2849
MDA	Medicaid admissions of STGH in 1982 (1) divided by total STGH admissions (1).	0.0867	0.0517	0.0382	0.0690
HEALTH SYSTEM VARIABLES					
ALOS	Total STGH inpatient days (1) divided by total STGH admissions (1).	7.8958	5.9201	6.7120	4.1620
OWN	Total number of beds of investor owned hospitals (13) divided by total number of beds of STGH (1).	0.0560	0.1956	0.000	0.7074
GHA	Difference between hospital admissions in 83 and 76 (1) divided by total STGH admissions (1).	0.0523	0.3528	0.2234	0.3283

Tables 5 and 6. Variables that were not significant in any regression are not included in Tables 5 and 6.

One of these omitted variables, the existence of mandatory rate regulation (REG), was included in the initial cost equations as a dummy variable, indicating the presence or absence of regulation. Its lack of statistical significance is not surprising, in light of the mixed results of other studies focused on the effect of regulation on cost.

Implications for Clark and Washoe Counties

The factors that account for the inter-county cost differences across the U.S. also account for much of the above average cost in Nevada's Clark and Washoe Counties. Table 7 shows the actual values of CPA and CPD and the values predicted by the regression for Clark and Washoe Counties. The nationwide average values are shown for comparison.

Compared with the national average cost per day of $352, CPD in Washoe County was $642. Based on the estimated regression results, the predicted value for Washoe County's characteristics would be $582. Thus, Washoe County's hospital cost experience is not an aberration; the factors that explain inter-county variations in CPD nationwide also explain 79 percent of the difference between CPD in Washoe County and the national average CPD.

Table 4, (continued)

Staff Patterns		Mean	S.D.	WASHOE COUNTY	CLARK COUNTY
INTENSA	Total number of FTE personnel of STGH (1) divided by total STGH hospital admissions (1).	0.0490	0.0149	0.0668	0.0549
INTENSD	Total number of FTE personnel of STGH(1) divided by total STGH inpatient days (1).	0.0078	0.0071	0.0099	0.0132
RN	Total number of FTE RN's of STGH (1) divided by total number of FTE personnel of STGH (1).	0.2770	0.0926	0.3396	0.3106
LPN	Total number of FTE LPN's of STGH (1) divided by total number of FTE personnel of STGH (1).	0.1532	0.0864	0.0852	0.1033
NP	Total nurse practioners in 1980 (7) divided by total number of FTE personnel of STGH (1).	0.0018	0.0056	0.0014	0.0021
Scope of Services Offered					
All service variables are divided by 1982 total population in thousands (2).					
AMSRG	Ambulatory Surgical service (1).	0.0049	0.0061	0.0019	0.0014
CTSC	Cat Scanner service (1).	0.0006	0.0013	0.0009	0.0006
HEMO	Hemodialysis service (1).	0.0003	0.0010	0.0005	0.0004
ICARD	Intensive Cardiac service (1).	0.0037	0.0050	0.0019	0.0012
PREM	Premature Nursery service (1).	0.0007	0.0016	0.0009	0.0004
HEART	Open Heart Surgery service (1).	0.0001	0.0003	0.0005	0.0006
RAD	Mv Radiation Therapy service (1).	0.0002	0.0006	0.0005	0.0000
BURN	Burn Care Unit service (1).	0.0002	0.0002	0.0000	0.0004
ECG	Electrocardiography service (1).	0.0058	0.0066	0.0019	0.0013
EMERG	Emergency Department service (1).	0.0062	0.0069	0.0014	0.0014
FAPL	Family Planning service (1).	0.0003	0.0016	0.0005	0.0002
HIST	Histopathology Lab service (1).	0.0021	0.0032	0.0009	0.0008
HOCA	Home Care Program (1).	0.0007	0.0025	0.0000	0.0000
OCPLTH	Occupational Therapy service (1).	0.0009	0.0025	0.0014	0.0005
PHARM	Pharmacy service (1).	0.0057	0.0065	0.0019	0.0012

CPA was $4,311 in Washoe County, which was substantially above the national average of $2,242. The regression predicted CPA equal to $3,778; the regression accounts for 74 percent of the difference between the Washoe County CPA and the national mean.

Washoe County does not represent an outlier for either the CPD or CPA regression at the 95 percent confidence level; the differences between predicted values of CPD and CPA and actual values are not statistically unreasonable.

The characteristics of Clark County lead to a predicted CPD of $775 that is more than twice the national average of $352. Actual CPD was $976; the regression accounts for 68

Table 4, (continued)

		Mean	S.D.	WASHOE COUNTY	CLARK COUNTY
Competitive Environment					
NHBD	Total set up of nursing home beds in 1980 (5) divided by total population over the age of 65 (6).	0.0659	0.0391	0.0288	0.0340
NHSCR	NHSC sites staffed in rural areas in 1931 (9) divided by total number of STGH in 1983 (1).	0.1004	0.3261	0.0000	0.0000
RHMO	1983 HMO membership (15) divided by total population in 1982 (2).	0.7903	0.0646	0.0000	1.007
Size/Capacity Utilization					
SZ5	Total number of STGH with 400 beds (1) divided by total number of STGH (1).	0.0442	0.1480	0.2500	0.1250
UTIL	Total STGH inpatient days (1) divided by total potential STGH inpatient days. The potential STGH inpatient days is calculated by multiplying the total number of STGH beds (1) by the number of days in a year, 365.	0.6191	0.1613	0.6804	0.4400
Teaching/Research					
MTH	Total memorial teaching STGH (1) divided by total STGH (1).	0.0171	0.0838	0.0000	0.0000
RMD	Total number of research MD's in 1981 (3) divided by total MD's in 1982 (4).	0.0057	0.0170	0.0101	0.0061
JCAHA	Total number of JCAH accredited (STGH) (1) divided by total number of STGH (1).	0.6757	0.4271	1.0000	0.8750
HPNS	Total number of STGH with professional nursing school (1) divided by total STGH (1).	0.0251	0.1145	0.0000	0.0000
SCL	Total STGH with medical school affiliation (1) divided by total STGH (1).	0.0637	0.1929	0.7500	0.1250

percent of the difference between CPD in Clark County and the national average CPD.

For CPA, the predicted value was $3,366 in Clark County, compared with the actual value of $4,062, and a national average of $2,241. The regression accounts for 62 percent of the difference between the value for Clark County and the national average.

The prediction errors were significantly large at the 95 percent level for both CPD and CPA, compared with the prediction errors for other counties. Clark County is therefore considered an outlier; it may have some unusual characteristics that significantly affect hospital costs.

Significant Cost Impacts of County Characteristics

Tables 5 and 6 detail the characteristics of Clark and Washoe Counties that account for their high predicted values of CPD and CPA. Table 8 summarizes the most important factors. Each of the characteristics listed in Table 8 accounts for at least 5 percent of the difference between predicted cost and the national average cost. In addition, the factors listed for each case in Table 8 collectively account for at least 90 percent of the difference between the local predicted cost and

Table 4, (continued)

Case Mix (Outputs)		Mean	S.D.	WASHOE COUNTY	CLARK COUNTY
ICU	Total ICU inpatient days of STGH (1) divided by total STGH inpatient days (1).	0.0362	0.0344	0.0851	0.0136
SA	Total subacute care inpatient days of STGH (1) divided by total STGH inpatient days (1)	0.1082	0.2302	0.0272	0.0000
OVEA	Total emergency outpatient visits of STGH (1) divided by total STGH admissions (1).	0.2020	0.1056	0.1598	0.3178
OVED	Total emergency outpatient visits of STGH (1) divided by total STGH inpatient days (1).	0.0331	0.0418	0.0238	0.0764
OVOA	Total outpatient visits STGH (1) divided by total STGH admissions (1).	0.3639	0.4074	0.2948	0.5256
ISRG	Total inpatient surgical operations of STGH (1) divided by total surgical operations of STGH (1).	0.7977	0.1347	0.8200	0.7836
ADMIT	Total STGH admissions (1) divided by total population (1,000's) in 1982 (2).	15.6850	8.0159	20.1690	13.5310
SRG	Total surgical operations of STGH (1) divided by total population (1000's) in 1982 (2).	6.3625	5.7539	10.1864	7.1560
Inputs					
WAGE	Wage index for urban areas in 1983 (14).	0.8969	0.1113	1.2988	1.2190
Regional Dummies					
D8	Dummy variable for the census division (8).	0.0837	0.2769	1.0000	1.0000

the national average cost.

If Washoe were an "average" county in which the value of each variable were precisely equal to the national average, the cost predicted by the regression would be equal to the national average cost. If one variable that tends to increase cost takes a value greater than average, the regression would predict a CPD or CPA above average. The difference between predicted CPD and average CPD would be equal to the difference between the Washoe County value of that variable multiplied by the regression coefficient for that variable. Thus, each variable's contribution to the difference between predicted and average CPD reflects both the deviation of the local value from the national average and the degree of influence that variable has on cost (measured by its regression coefficient). Columns c and d of Table 5 list each variable's contribution to Washoe County's above average predicted CPD in Washoe County, and the standard deviation of that estimated contribution. Columns e and f of Table 5 provide the same information for Clark County, while columns c - f of Table 6 provide analogous information for CPA. As summarized in Table 8, the lists of factors that explain high predicted CPD and CPA in the two counties are very similar. Four variables appear in each of the four cases: high ratio of personnel to patients, high area wages, high per capita income, and rapid population growth since 1970.

The ratio of full-time equivalent personnel to either inpatient days or hospital admissions is an important explanatory variable for CPD and CPA. This ratio varies widely across counties; the standard deviation is 91 percent of the mean for the personnel/inpatient day ratio and 30 percent of the mean for the personnel/admission ratio. Several hypotheses have been suggested to explain the variations in the personnel/

Table 4, (continued)

Notes:

a) The numbers in parentheses refer to the following data sources on the variables used in the study:

(1) County Hospital File from American Hospital Association Annual Survey

(2) Local Area Personal Income (LAPI), US Department of Commerce, Bureau of Economic Analysis

(3) American Medical Association Physicians Master File Tape

(4) American Medical Association Distribution of Physicians

(5) National Master Facility Inventory/National Center for Health Statistics (NMFI/NCHS)

(6) 1980 Census of Population and Housing Summary Tape File (STF)

(7) National Center for Health Services Research (NCHSR) Nurse Practitioners (NP) Data

(8) 1980 Census of Population, Equal Opportunity Special File

(9) National Health Service Corporations (NHSC) Site Tape

(10) Division of Medicine, Graduate Medical Education (GME) File

(11) 1970 Census of Population, US Department of Commerce

(12) County and City Data Book (CCDB), US Department of Commerce, Bureau of Census

(13) Hospital Statistics, American Hospital Association

(14) Federal Register, Vol. 48, No. 171, Sept. 1, 1983

(15) HMO Census, Health Care Financing Administration (HCFA)

b) The following variables were included in the initial regressions equations, but were eliminated from further consideration because they were statistically insignificant: proportion of admitted patients over age 65; growth rate of the number of STG hospital beds 1970-1983, growth rate of the number of STG hospitals 1970-1983; the per capita number of hospitals offering each of 9 specific services (in addition to the 14 services listed in Table I under 'scope of services offered'); number of nursing home beds per capita; proportion of STG hospitals staffed as NHSC sites; proportions of STG hospitals with 0-99, 100-199, 200-299, and 300-399 beds; proportion of MD's classified as administrative; proportion of STG hospitals with professional nursing schools; total number of residency programs offered per hospital; and proportion of inpatient days involved in acute care.

patient ratios. First, a high ratio could reflect a labor-intensive operation and a low capital to labor ratio. Second, some evidence suggests that operation of equipment such as CAT scanners increases the required personnel/patient ratio. Third, inefficient management could result in poor utilization of personnel. Fourth, labor intensive hospitals could have case mixes weighted toward patients requiring intensive nursing care. Fifth, a high personnel/patient ratio could result from above-average vertical integration, wherein hospital employees perform tasks such as lab work that may be performed by non-hospital firms in other counties. Such vertical integration would raise the apparent personnel/patient ratio, but it would not necessarily increase the total number of man-hours required to deliver a given level of health care services. If vertical integration facilitates smooth and efficient operations, it may actually reduce the required number of man-hours. Such integration appears to increase cost per patient, but this reflects only the hospital portion cost. Total expense per patient, including cost incurred by non-hospital entities is not necessarily affected by vertical integration.

Sixth, Blumberg and Gentry (1978) argue that a hospital with a high ratio of staff to patients can schedule tests and procedures smoothly to minimize length of stay. A high-intensity hospital would therefore be expected to have a low ALOS. Assuming that the number of tests and procedures is independent of intensity, a high-intensity hospital also has high CPD. Further detailed analysis to determine the validity of these hypotheses is needed before effective policies can be designed to reduce CPD or CPA.

Wages are measured by the wage index published by the Health Care Financing Administration and used to adjust diagnostic related group (DRG) payments for regional differences. The wage index is based on Bureau of Labor Statistics data for hospital employees. The index used here, which was published in the September 1983 *Federal Register*, was calculated using 1981 BLS data. This data lag is acceptable because the index measures inter-county wage relationships, which are assumed to be relatively stable.

The high wage indexes and high ratios of personnel to patients account for at least half of the difference between the

Table 5
CPD Regression Results

VARIABLE	REGRESSION RESULTS		VARIABLE CONTRIBUTION TO ABOVE AVERAGE CPD			
			WASHOE COUNTY		CLARK COUNTY	
	Coefficient Estimate	Standard Deviation	Estimated Contribution	Contribution Standard Deviation	Estimated Contribution	Contribution Standard Deviation
	(a)	(b)	(c)	(d)	(e)	(f)
DEMOGRAPHIC						
gpop	38.26	6.93	20.29	3.68	25.99	4.71
pi	0.01	0.00 (g)	37.64	4.34	20.03	2.31
f	251.84	92.90	4.40	1.62	2.84	1.05
mca	42.82	19.10	-4.92	-2.20	-3.19	-1.42
mda	197.49	33.22	-9.58	-1.61	-3.49	-0.59
HEALTH SYSTEM						
alos	1.13	0.45	-1.34	-0.53	-4.22	-1.68
own	67.52	8.09	-3.78	-0.45	43.99	5.27
gha	10.75	4.81	1.84	0.82	2.97	1.33
STAFFING						
intensd	35,182.52	504.41	75.82	1.09	189.49	2.72
rn	310.19	19.71	19.43	1.23	10.41	0.66
lpn	156.17	19.49	-10.62	-1.33	-7.79	-0.97
np	-1,186.59	281.86	0.44	-0.11	-0.37	0.09
SERVICES OFFERED						
ainsrg	-597.43	415.00	1.78	-1.24	2.11	-1.46
icard	-775.60	386.06	1.38	-0.69	1.96	-0.97
burn	-5,441.63	1,000.45	1.09	-0.20	-1.04	0.19
ecg	941.04	573.52	-3.65	-2.22	-4.17	-2.54
emerg	-1,208.67	687.32	5.75	-3.27	5.84	-3.32
hoca	1,253.27	628.53	-0.88	-0.44	-0.88	-0.44
pharm	-764.29	531.67	2.89	-2.01	3.46	-2.41
COMPETITIVE ENVIRONMENT						
hmo	0.56	0.25	-0.19	-0.23	0.12	0.05
SIZE						
util	-72.34	14.44	-4.44	-2.26	12.96	-2.59
TEACHING/RESEARCH						
jcaha	11.61	4.34	3.76	1.41	2.31	0.86
CASEMIX						
icu	180.26	54.25	8.82	2.66	-4.07	-1.22
sa	40.10	11.32	-3.25	-0.92	-4.34	-1.22
oved	1,377.24	82.61	-12.80	-0.77	59.58	3.57
isrg	-34.45	12.79	-0.77	0.29	0.48	-0.18
admit	2.80	0.39	12.58	1.73	-6.04	-0.83
srg	-1.10	0.54	-4.21	2.05	-0.87	0.43
WAGE						
wage	169.04	18.55	67.94	7.46	54.45	5.98
REGION						
d8	25.49	6.24	23.35	5.72	23.35	5.72
constant	-362.73	30.10	0.00	0.00	0.00	0.00

a) OLS coefficient estimates of the CPD regression.
b) Standard deviations of the coefficient estimates.
c) (W-N)*R, where W = value of the variable in Washoe County,
N = national average for that variable
R = CPD regression coefficient from column (a).
d) (W-N)*S, where S = stand. deviation of the regression coefficient from column (b).
e) (C-N)*R, where C = value of the variable in Clark County.
f) (C-N)*S
g) Standard deviation is reported as zero dur to rounding.

Table 6
CPA Regression Results

VARIABLE	REGRESSION RESULTS		VARIABLE CONTRIBUTION TO ABOVE AVERAGE CPA			
			WASHOE COUNTY		CLARK COUNTY	
	Coefficient Estimate	Standard Deviation	Estimated Contribution	Contribution Standard Deviation	Estimated Contribution	Contribution Standard Deviation
	(a)	(b)	(c)	(d)	(e)	(f)
DEMOGRAPHIC						
gpop	170.72	31.69	90.53	16.80	115.97	21.53
popden	0.01	0.00 (g)	-2.60	-0.93	-2.24	-0.80
pi	0.05	0.00 (g)	217.17	20.61	115.56	10.97
f	1,451.00	434.49	25.35	7.59	16.36	4.90
mca	167.26	89.41	-19.23	-10.28	-12.47	-6.67
mda	894.69	153.37	-43.39	-7.44	-15.81	-2.71
HEALTH SYSTEM						
alos	33.51	2.17	-39.66	-2.57	-125.10	-8.12
own	296.45	37.33	-16.60	-2.09	193.12	24.32
STAFFING						
intensa	23,030.50	701.21	410.45	12.50	135.33	4.12
rn	1,321.60	95.49	82.77	5.98	44.37	3.21
lpn	521.38	93.87	-35.47	-6.39	-25.99	-4.68
SERVICES OFFERED						
ctsc	21,116.41	6,048.99	7.61	2.18	-0.27	-0.08
hemo	22,462.81	7,831.92	4.05	1.41	2.06	0.72
prem	-8,238.43	4,608.68	-2.15	1.20	2.54	-1.42
heart	99,450.51	27,993.45	37.82	10.65	48.46	13.64
burn	-14,157.45	4,535.72	2.83	-0.91	-2.71	0.87
ecg	8,043.04	2,563.31	-31.20	-9.94	-35.63	-11.35
emerg	-13,087.95	2,644.52	62.29	-12.59	63.21	-12.77
fapl	12,747.69	4,684.41	2.30	0.84	-1.33	-0.49
hist	5,392.68	2,300.55	-6.14	-2.62	-7.10	-3.03
ocplth	158.67	25.24	0.09	0.01	-0.05	-0.01
COMPETITIVE ENVIRONMENT						
nhbd	-521.41	194.11	19.32	-7.19	16.62	-6.19
nhscr	51.91	22.21	-5.21	-2.23	-5.21	-2.23
hmo	2.99	1.15	-2.37	-0.91	0.65	0.25
SIZE						
sz5	22.00	66.96	4.53	13.78	1.78	5.41
util	-286.38	62.28	-17.56	3.82	51.29	-11.15
TEACHING/REASEARCH						
mth	495.08	122.79	-8.47	-2.10	-8.47	-2.10
rmd	958.68	515.87	4.22	2.27	0.44	0.23
jcaha	105.60	20.09	34.25	6.52	21.05	4.00
hpns	155.36	67.70	-3.90	-1.70	-3.90	-1.70
scl	159.59	51.62	109.53	35.43	9.78	3.16
CASEMIX						
icu	1,214.26	249.02	59.43	12.19	-27.40	-5.62
sa	89.02	52.71	-7.21	-4.27	-9.63	-5.70
ovea	317.49	80.02	-13.39	-3.38	36.76	9.27
ovoa	173.26	20.99	-11.97	-1.45	28.02	3.40
isrg	-166.74	58.28	-3.72	1.30	2.35	-0.82
admit	4.55	1.82	20.41	8.17	-9.80	-3.92
srg	-2.56	2.64	-9.78	10.10	-2.03	2.10
WAGE						
wage	1,383.08	90.57	555.86	36.40	445.49	29.17
REGION						
d8	74.87	28.82	68.60	26.41	68.60	26.41
constant	-1667.60	136.95	0.00	0.00	0.00	0.00

a) OLS coefficient estimates of the CPA regression.
b) Standard deviations of the coefficient estimates.
c) (W-N)*R, where W = value of the variable in Washoe County,
N = national average for that variable, and
R = CPA regression coefficient from column (a).
d) (W-N)*S, where S = standard deviation of the regression coefficient from column (b).
e) (C-N)*R, where C = value of the variable in Clark County.
f) (C-N)*S.
g) Standard deviation is reported as zero due to rounding.

Table 7
Actual and Predicted Costs

	Washoe County	Clark County	U.S. Avg.
CPD:			
Actual value	$ 642	$ 976	$ 352
Predicted value	$ 582	$ 775	
CPA:			
Actual value	$4,311	$4,062	$2,241
Predicted value	$3,778	$3,366	

local predicted value and the national mean in each case. In Clark County, predicted CPD is $422 greater than the national average; $243 of this difference is attributed to wage and labor intensity of hospital personnel. In Washoe County, wage and labor intensity increase predicted CPD above the national mean by $144. In Clark County, predicted CPA is $1,125 above the mean; wage and intensity account for $581 of this difference. In Washoe County, predicted CPA is $1,539 above the mean; wage and intensity account for $966 of this difference.

These two variables were previously found to be important determinants of changes in interstate cost differences between 1973 and 1979, (see Joskow (1981, p. 150)). He found that changes in wage rates and increases in personnel per bed were two of the major factors leading to interstate differences in the rate of growth of total hospital expenditures.

Per capita income is substantially above average in both Clark and Washoe Counties. Per capita income in Clark County was $11,652, compared with $13,740 in Washoe County and $9,277 nationwide. While numerous analysts have noted a relationship between per capita income and cost, these analysts do not agree on the nature of the relationship. The first attempt to establish limits for Medicare reimbursement in 1974 was based on the implicit assumption that per capita income exerts a significant impact on cost. Some analysts have suggested that high per capita income may be associated with high cost because higher income patients demand higher quality services or because the hospital perceives that they are willing to pay more and simply charges higher rates.

Alternately, high per capita income may be associated with the high area wages. If wages and personal income are highly correlated, the positive regression coefficient on per capita income may actually reflect some of the effect of high wages on cost. A third possibility is that the relationship is more complex. Differences in income may be associated with differences in hospital use. Knickman and Foltz (1984) found a negative relationship between per capita income and hospital admission. This suggests that lower income is associated either with greater need for hospital care or with a greater tendency for treatment to occur at a hospital rather than some alternate setting. Thus, high income could be associated with a tendency to seek hospital care only for more serious illness, which could result in higher average cost. The interactions between income and hospital use and hospital average cost are not clearly understood and are controversial.

Rapid population growth presumably leads to increased cost because it requires construction of new facilities. Newer facilities may have higher depreciation expenses and may have been financed during periods of high interest rates.

The fact that Nevada is located in the Mountain Region (as defined by the Census Bureau) was significant in three of the four cases. Previous researchers have noted that states in the Pacific and Mountain regions tend to experience above-average costs even after other factors described here have been taken into account. Regional impacts on cost have been documented by Rothberg (1982), Grannemann, Brown and Pauly (1986), Knickman and Foltz (1984), and Freund, Shachtmen, Ruffin and Quade (1985). Rothberg (1982) suggests that inter-regional population movements may be important. Migration patterns affect both overall population growth rates and the growth rates of individual population segments. For example recent migration patterns have led to rapid growth of elderly populations in some southern and western states. The resulting regional differences in demographic composition of the population may lead to regional differences in the types of health care services provided.

Washoe County has an unusually high proportion of personnel that are registered nurses, which contributed to the high cost. This was accompanied by a relatively low proportion of licensed practical nurses, that decreased predicted CPD in Washoe County. One characteristic of the Clark County health care system operates to reduce the predicted CPA. Clark County's below average ALOS reduces the predicted CPA by $125 compared with the level that would have been predicted if Clark County's ALOS had been equal to the national average.

A high proportion of investor-owned hospitals increased predicted CPD and CPA in Clark County. The relationship

between ownership and cost is controversial and not well-understood. Results of some previous research (see Grannemann, Brown and Pauly (1986) and Renn, Schramm, Watt and Derzon (1985) indicate that investor-owned hospitals incur higher costs and levy higher charges. Other work (see Sloan and Vraciu (1983)) reports no significant differences in CPA and profit between investor-owned and other types of hospitals. Analysts have not yet reached agreement on appropriate techniques for adjusting conventional accounting reports for differential treatment of taxes and charitable donations between investor-owned and other types of hospitals. Some analysts hypothesize that investor-owned hospitals tend to treat less severely ill patients. Empirical evidence on this question is also mixed (see Bays (1977) and Renn, Schramm, Watt, and Derzon (1985)). The impact of investor-ownership on cost may be partially explained by self-selection of investors into specific hospital markets. Mullner and Hadley (1984) report that increases in the market share of proprietary chains are greatest in states with rapid population growth, high per capita income, high rates of insurance coverage, and substantial proprietary market shares already in existence.

The ratio of emergency visits per inpatient day is above average in Clark County and below average in Washoe County. Since CPD is calculated by dividing total cost by the number of inpatient days, Clark County's above average ratio increases measured CPD, while Washoe County's below average cost decreases measured CPD. This method of calculating CPD differs from the approach (described above) used by the AHA survey. The method used here avoids the presumption in the AHA method that the ratio of inpatient:outpatient revenues reflects the underlying ratio of inpatient:outpatient expenditures. These ratios would only be equal if prices accurately reflect the underlying cost structure.

The number of hospital admissions per capita, which were above the national average in Washoe County contributed to above average CPA in Washoe County. Some researchers hypothesize that if each county population experiences a comparable mix of illnesses, differences in admissions per capita will indicate differences in case-mix severity treated by the hospital. Two (contradictory) factors could explain the differences in admissions per capita. High per capita admissions could indicate that many patients are treated in the hospital that are routinely treated in non-hospital settings in other counties. Assuming cases that can be treated in non-hospital settings are relatively mild and inexpensive, high admissions per capita would result in relatively low cost. On the other hand, high per capita admissions could reflect a county's hospitals' roles as regional medical centers, providing sophisticated (and expensive) care for residents of surrounding rural counties. In this case, high admissions per capita would be associated with high cost. Washoe County's experience is consistent with the second explanation.

The proportion of hospitals affiliated with a medical school increased CPA in Washoe County. Kelly (1984) noted that teaching hospitals tend to be significantly larger, have higher occupancy rates, do more surgery, and provide more outpatient services than non-teaching hospitals. In addition, cost per admission tends to be higher at teaching hospitals.

Table 8
Summary of Results
Siginificant Factors Leading to High Cost*

	CPD		CPA	
	Washoe	Clark	Washoe	Clark
Personnel/day	+	+		
Personnel/admission			+	+
Wage index	+	+	+	+
Per capita income	+	+	+	+
Mountain region	+	+		+
Population growth	+	+	+	+
RN's/personnel	+		+	
Emergency visits/day	-	+		
Admissions per capita	+			
Investor-owned/total		+		+
Average length of stay				-
Teaching involvement			+	

*Impact is greater than 5 percent of the difference between predicted value and national average.
Note:
Factors identified by plus sign (+) increase cost whereas factors identified by minus sign (-) lead to decreased cost.

Conclusion

This analysis has identified major factors contributing to the high cost of hospital care in Nevada. The ratio of staff to patients and hospital employee wages are among the three most important factors in each of the cases discussed here.

The county characteristics listed in Table 8 can be separated into two categories: (i) characteristics of hospital management decisions and (ii) county characteristics that are independent of health care decisions. For example, area wages, per capita income and population growth are probably not appropriate vehicles for government hospital cost containment policy. In contrast, state policy can potentially influence hospital management decisions either directly through regulation or indirectly via payment mechanism incentives. Cost elements that could potentially be influenced by government policy include staffing and operating patterns, hospital ownership patterns, the extent of facilities available, the level of teaching and research commitment, average length of stay and the extent to which hospitals provide outpatient emergency care. Careful thought must be given to the implications of trying to alter any of these variables. Designing policies to attempt to reduce cost by reducing variables such as average length of stay or emergency visits per inpatient day could reduce reported cost without reducing actual costs. Targeting variables such as the availability of services or teaching and research commitments might require careful evaluation of tradeoffs between cost and quality of service.

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Regional Differences in Savings and Loan Performance: The Case of the Eleventh District

*by Jack H. Rubens**

Introduction

The savings and loan association (SLA) industry faced significant structural changes in the first half of the 1980's. Record high market interest rates in 1981 and 1982, restrictive regulations and massive disintermediation resulted in large losses for the industry as a whole.

To aid in their recovery, SLAs were granted many new and significant powers under the Depository Institutions Deregulation and Monetary Control Act of 1980 and the Garn-St. Germain Depository Institutions Act of 1982. These new powers were enacted to help the industry lessen the effects of disintermediation by creating new accounts which pay market rates of interest, decreasing SLAs' interest rate sensitivity by permitting the use of variable-rate mortgages, reducing risk through diversification on the asset side of the balance sheet and increasing liability volume by creating new deposit instruments.

The thrift industry has been dramatically altered by the volatile environment and deregulatory legislation. Significant changes on both sides of the balance sheet and on the income statement have occurred since the halcyon days of the late 1970's. Asset concentration in mortgages has been dramatically lessened, new deposit instruments have changed liability composition, and the components of profitability have been dramatically altered.

Several studies have noted interstate differences with respect to profitability and operating characteristics. As fully integrated interstate branching takes hold in the United States, potential acquirers must realize that, because of regional differences, profitable strategies which worked in one state may not necessarily yield profitable results in another.

To investigate this issue, *t*-test analysis will be performed on the means of various salient ratios for all FSLIC-insured SLAs in the eleventh district versus that of all FSLIC-insured SLAs in all other districts, as of December, 1985. The eleventh FHLBB district encompasses Arizona, California and Nevada.

The purpose of this research is two-fold. First, it will examine whether significant regional differences exist in the SLA industry. Second, if strong regional differences are found to exist, the implications of such findings for potential interstate expansion will be discussed. Third, the relationships between the results and the thrift crisis as of 1990 is explored, along with the Financial Institutions Reform, Recovery and Enforcement Act of August 1989.

Review of the literature

Previous research on SLA profitability and operating characteristics can be divided into four areas--differences based upon form of organization (mutual or stock), charter type (Federal or state), profitability levels and financial statement characteristics. The current study is a combination of the latter two areas.

The third area of research involves dividing the industry into two groups based upon profitability and comparing various balance sheet indicators between the two groups to determine what makes for a profitable association. Smith, Kaplan and Ford (1977) analyzed balance sheet characteristics of the top ten percent of all SLAs within each of five asset size classes to determine why the high performers (defined as the top ten percent in profitability within each size class) are more profitable than others. They found that the most profitable associations are located in high growth areas, have an average higher yield on their asset portfolio, lower operating expenses, a greater proportion of fee income to total income and larger FHLB advances.

Verbrugge, Shick and Thygerson (1976) analyzed the components of SLA profitability for 1971 and 1972. Significant variables contributing towards high profitability included: 1) percentage of mortgages to total loans; 2) fee to total income; 3) net worth to savings; 4) certificate of deposits to total savings; and 5) operating expenses to average assets.

Verbrugge and Goldstein (1978) examined the effects that environmental factors, primarily local economic conditions, have on association profit ability. They found that, although location is an important factor, its adverse effects can be overcome by efficient management.

Verbrugge and Goldstein (1981) found that the top quartile performers for the 1978-1981 period (a time of rapidly declining financial strength for the industry as a whole) achieved healthy profits by increasing their proportion of assets in interest-sensitive assets, controlling costs, increasing interest yields and moderate growth.

Rubens (1987) examined the changing components of SLA

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profitability on a state-by-state basis in 1978 and 1983 for the ten percent most profitable associations in each state. He concluded that not only do regional differences exist, but that profitability strategies have changed significantly since the advent of deregulation.

Three recent studies have examined what SLA strategies have been successful in maintaining profitability in the 1980's. Curry, Rose and Thompson (1988) compared groups of high and low profit solvent institutions (as measured by return on net worth) on a semiannual basis from 1980 to 1986. They found that both operating and nonoperating income, in addition to operating expense control, explain the profitability differences.

Rudolph and Topping (1988) use cluster analysis to group associations by the extent to which they have expanded beyond traditional thrift areas. Using a sample time from 1979 to 1987, they find that the most profitable groups expanded beyond their traditional areas only slightly (either by purchasing mortgage-backed securities or by increasing cash and investments). The most unsuccessful groups expanded into nonmortgage loans or acquisition and development loans.

Kaplan (1988) also groups SLAs according to investment strategies and finds that asset size, geographic location and, most importantly, high levels of capital make it such that a plethora of strategies can help thrifts survive and prosper in the current environment. The key element in each of the dominant investment strategies, however, is a continued reliance upon single-family mortgage loans.

Data and methodology

Data was obtained from the December 1985, *Statement of Financial Condition* tapes assembled by the FHLBB. All FSLIC-insured SLAs are included. As 99 percent of all assets in the industry are covered by FSLIC insurance, nearly all eleventh district SLAs are included (and certainly all but the smallest associations).

Year-end 1985 was considered an appropriate cut-off as the last three years can hardly be classified as typical for the industry; ROA dropped from 0.39 percent in 1985 to 0.01 percent in 1986 before entering a veritable black hole. Since 1986, the ill-advised policy of regulatory forbearance began to severely affect industry averages, as insolvent but still operating SLAs, particularly in the Southwest, engaged in high risk projects. Such extreme losses would dramatically increase the standard deviation of the mean returns. As the standard deviation is the risk measure used in *t*-tests, the results presented here would have been greatly distorted.

The eleventh FHLBB district is the nation's largest and includes eight out of the ten largest SLAs in the country. The 239 thrifts, located in Arizona, California and Nevada, had total assets, as of December 1985, of $294 billion. Robinson (1986) notes that the level of profitability in the district is below the industry average and it ranks second to the Dallas district in percentage of failed to healthy institutions. Most of the district's problems can be traced to the then-current deflationary environment which contributed greatly to the rapid decline in real estate values.

The ratios selected for the study are presented in Exhibit 1 and were chosen to represent nearly all facets of SLA profitability and financial composition. The first four variables are commonly-used profitability measures. Variables five through thirty-six measure balance sheet composition. The final sixteen variables relate to income statement relationships.

Means for the ratios are calculated for district eleven associations and all other SLAs in the country. To determine whether significant differences existed between the means for each of the variables, *t*-statistics are then calculated. Instead of comparing district means to total industry means, district eleven results are excluded from the industry figures. Furthermore, means for Nevada SLAs are separated from other eleventh district SLAs to examine possible operating differences.

Results from the Eleventh District

Exhibit 2 shows the rapid deterioration and partial recovery of the SLA industry by the end of 1985. As market interest rates declined beginning in late 1982, the industry's position slowly began to improve. Record levels of profits and new net savings inflows occurred in 1978, reached their depths in 1981 and slowly improved until the end of 1985, as a result of lower interest rates and new deposit instruments (most notably SuperNOWs and MMDAs). Exhibit 2 also reveals that while 556 failures occurred between 1978 and 1985, the total number of SLAs decreased by 1,409 over this period. This disparity was a result of the Federal Home Loan Bank Board's then-current strategy of merging ailing institutions.

Exhibit 3 presents the results of the *t*-tests. As can be seen in a cursory glance, the value of comparing individual districts with the rest of the country is obvious; 41 of the 52 variables (79 percent) are significant at least at the 10 percent level. Thus, strong regional differences do appear to exist.

Variables one through four reflect the profitability problems of eleventh district SLAs. The ratios involving net income (VAR1 through VAR3) are significantly lower for the district than the rest of the industry. VAR4 is, however, significantly higher, reflecting the lack of expense control on the part of the district associations. A discussion of this issue will be presented later in this section.

The balance sheet ratios (VAR5 through VAR36) reveal significant differences in asset and liability composition. District associations show a greater reliance upon borrowed money (VAR12, VAR13, and VAR25, VAR26 and VAR27) than the rest of the industry. Borrowed money not only represents participation in the money markets and discount window loans, but also advances from the FHLBB. These advances, unique to the thrift industry until the passage of the Financial Institutions Reform, Recovery and Enforcement Act of 1989, represents long-term borrowings from the Bank Board to be used for extended financial ills.

The district associations' profitability problems can, in large part, be traced to significantly lower interest rates on loans (VAR6, VAR7, VAR8 and VAR14) and significantly higher rates on deposits (VAR9, VAR11 and VAR13) than the indus-

try norms. These lower revenues and higher costs were not offset by the significantly higher loan fees and service charges, as indicated by VAR5 and VAR10. These findings are all consistent with highly competitive markets (Kidwell and Peterson (1987)).

Further analysis of the balance sheet ratios reveals a higher than average reliance on conventional mortgages and a lower than average level of nonmortgage loans (VAR16 through VAR18 and VAR22). The large proportion of assets in conventional mortgages comes at the expense of investment in government mortgages (VAR21) and nonmortgage loans (VAR18 and VAR34). Thus, it appears that district thrifts are not quickly taking advantage of the new powers granted under the deregulatory acts of this decade.

As can be seen by VAR28 through VAR31, eleventh district associations are better capitalized than the average SLA in the remainder of the country. Due to the lag time between lessened profitability and capital levels (see Kidwell and Peterson (1987)), this may merely be a temporary condition.

Other findings worth noting include a lower-than-average reliance on brokered deposits (VAR36), which some claim are a source of industry instability (see Harless (1984)) and a significantly higher proportion of fixed assets (VAR20), possibly the result of extensive and long-established branching networks, especially in California. Finally, district associations tend to be more liquid than the rest of the industry (VAR19 and VAR33). These last two ratios concern percentage of total assets left in low or non-yielding accounts, such as short term investment securities.

Income statement results (VAR37 through VAR52) reveal a lack of effective expense control on the part of SLAs in the district. It can be seen that interest received on loans is a lower percentage of total income for district associations than the rest of the industry (VAR37 through VAR39). Further, as discussed earlier, the reliance on loan fee and service charge income is significantly higher than other districts' associations (VAR40).

The expense figures (VAR42 through VAR48, VAR50 and VAR51) reveal significantly higher expense ratios for the district. The only anomalies are VAR46, which is probably more the result of higher overall expenses than lower than average director and employee expenses, and VAR48 -- a measure of advertising levels, which may not be an intelligent choice of expenses to attempt to control. The final two income statement ratios (VAR49 and VAR52) reflect lower inter-association deposits and lower profitability.

Results from Nevada SLAs

Although eleventh district thrifts under-perform the industry, most of the problem SLAs are located in California. It will therefore be useful to examine Nevada SLAs vis-a-vis other district eleven SLAs to determine how some thrifts have remained viable and have even prospered during the 1980s.

As is evident from Exhibit 4, California dominates the eleventh FHLBB district. More than 90 percent of all SLAs are in California. Furthermore, the average California thrift branch has almost twice the level of deposits per branch and three more branches per SLA than Nevada thrifts.

Exhibit 5 presents the ratio means for Nevada and all other 11th district SLAs. Unfortunately, the *t*-test analysis performed in the last section cannot be conducted here. Because of the wide sample size disparities (only 7 Nevada SLAs versus 232 other eleventh district SLAs), the variances are not equal and all t-test results are rendered insignificant. However, the trends in the previous analysis and consistent patterns in the ratios in Exhibit 5 can help ascertain why some thrift strategies are successful while others are not.

The profitability ratios show that the Nevada thrifts were more profitable than other SLAs in the district. All net income measures (VAR1 through VAR3) show higher levels for the Nevada thrifts. VAR4 is higher for other district eleven thrifts, reflecting less efficient expense control, higher deposit rates and a greater reliance on borrowed money. An expansion of these differing income sheet and balance sheet characteristics is discussed below.

Nevada SLAs had a much lower reliance upon advances and other borrowed money than other district thrifts (VAR12, VAR25 through VAR27). Funding growth and liquidity through brokered deposits (VAR36) also shows differing strategies as other district SLAs had over ten times more brokered deposits (as a percentage of total deposits) than their Nevada counterparts. Further earnings squeezes resulted from lower interest rates on loans (VAR6 through VAR8, VAR14), undoubtedly the result of greater competition. Finally, no readily observable higher levels of income came from loan fees and servicing charges (VAR5 and VAR10) or lower deposit rates (VAR9 and VAR11) to counteract these higher costs.

Other balance sheet characteristics help reveal Nevada thrifts' strategies. They had a lower proportion of assets in conventional mortgages than the rest of the district thrifts (VAR16, VAR17 and VAR22), a lower need for liquidity (VAR19, VAR33), higher proportions in insured mortgages (VAR21) and nonmortgage loans (VAR16, VAR34) and higher deposit levels (VAR24, VAR32).

The non-interest expense ratios for the Nevada thrifts are lower as a percent of total assets (VAR42 through VAR45). However, as measured as a percentage of total operating expense (VAR46 through VAR48), Nevada thrifts have higher expense ratios except for advertising expense (VAR48). This seeming paradox is indicative of the higher interest costs, greater use of borrowed money and larger size of other district thrifts.

When looking at total operating expenses as a percentage of total income (VAR50), the relative cost advantages of the Nevada thrifts become clear as the ratio is over 75 percent higher for other district thrifts. Further, nonoperating expenses as a fraction of total income (VAR51) are over five times higher for other eleventh district thrifts than Nevada SLAs.

Relationship between results and the present crisis

Carron (1989) lists nine factors which were in some way responsible for the current thrift bailout:

1. Interest rate ceilings on deposits;
2. Fixed-rate mortgages;
3. Increased competition;
4. Inadequate net worth;
5. Misuse of extended federal and state asset powers;
6. 'The moral hazard' incentives from the deposit insurance system;
7. Management fraud;
8. Supervisory failures by regulators; and
9. Regulator failures to close insolvent thrifts.

Carron posits that the need for external funding was the result of the last five factors.

Other recent work has also focused in on regulatory failures. Brumbaugh (1988) notes the ill-advised lowering of capital standards during the industry downturn, relaxed supervision, inadequate staffing and regulatory forbearance. Garcia (1989) posits that Congressional inaction resulted from ignorance of the extent of the problem. She contends that Congress erroneously assumed that lower interest rates had 'solved' the problem in the early 1980s and would now solve it again. Kane (1989) states that the incentive system discouraged regulators from adequately addressing the problem.

Robinson (1986) notes that thrift problems in the eleventh district are directly traceable to the disinflation of the early 1980s and the corresponding soft real estate market which resulted in large vacancy rates for commercial projects and unsold residential properties. These failed real estate loans resulted in a liquidity crunch which caused thrifts, almost all in California, to rely heavily upon brokered deposits and FHLB advances rather than more stable, and less costly, consumer deposits. As discussed in the results section, this greater reliance upon non-deposit sources of funding is readily apparent.

Nevada SLAs were able to avoid most of these funding problems; percentage usage of borrowed funds and brokered deposits were one-half and one-tenth, respectively, of other district associations. Further evidence of Nevada SLAs' relative financial strength is that all Nevada thrifts currently meet the 1.5 percent tangible net worth requirement of the recently-passed industry bailout law (the Financial Institutions Reform, Recovery and Enforcement Act of 1989). On the other hand, 38 of the 672 institutions (5.7 percent) with insufficient tangible goodwill are California thrifts (*Wall Street Journal*, 1989). Finally, six under-capitalized thrifts are in Arizona.

The implications of FIRREA

On Aug. 9, 1989, President Bush signed into law the Financial Institutions Reform, Recovery and Enforcement Act of 1989 (FIRREA). The legislation is designed to improve supervision, bolster the insurance funds, increase public confidence in the SLA industry and take measures to prevent repeat occurrences. Specifically, FIRREA:

1. Creates the Office of Thrift Supervision (OTS), a new Treasury agency, to assume all regulatory functions of the dismantled Federal Home Loan Bank Board;
2. Establishes the Federal Housing Finance Board to oversee the 12 district Federal Home Loan Banks;
3. Creates two new FDIC-managed insurance funds (the Savings Association Insurance Fund and Bank Insurance Fund) and expands the FDIC board from three to five members to include the Comptroller of the Currency and the Director of the OTS;
4. Raises $50 billion through bond offerings and given to a new agency, the Resolution Trust Corp., to bring insolvent thrifts up to zero capital. This includes the 250 thrifts currently under FDIC conservatorship and the approximately 300 insolvent thrifts not yet under the conservatorship program.
5. Increases insurance premiums for banks from the current 8.3 basis points (bp) of total domestic deposits to 12 bp in 1990 and 15 bp in 1991. Insurance premiums for thrifts change from the current 20.8 bp to 23 bp in 1991, 18 bp in 1995 and 15 bp in 1998. The premium could increase to 32.5 bp under the worse-case scenario.
6. Hopes to collect $40 billion through higher premiums and sale of repossessed assets over the next three years to pay off the closing of the 233 thrifts taken over in 1988 and an additional $24 billion through higher premiums after the third year (through the tenth year) to pay for additional insolvencies.
7. Increases capital requirements to 1.5 percent tangible capital and to 3 percent by 1994. Currently 672 thrifts do not meet the new standard and an additional 300 more do not meet the 1994 standard. Further, goodwill can no longer count as capital and must be written off within 5 years.
8. Allows commercial bank holding companies to buy healthy thrifts.
9. Requires that SLAs must invest 70 percent of their assets in mortgage-related activities and restrict commercial real estate loans to 400 percent of capital; and
10. Prohibits SLAs from investing in junk bonds or direct equity holdings unless they invest through separately capitalized subsidiaries.

Although promising much, FIRREA is deficient in a number of areas. Most importantly, there is little in the Act to prevent the same crisis from re-occurring. Brewer (1989) notes that until thrift assets are marked-to-market, the increased capital requirements are still inadequate. Although the switch from Regulatory Accounting Principles (RAP) to Generally Accepted Accounting Principles (GAAP) in January 1989 presented a more accurate picture, GAAP still underestimates industry woes. Under market value accounting, SLA industry net worth remained consistently negative throughout the 1980s.

Recent increases in the estimates of final cost of the bailout (as high as $500 billion) highlight another problem with the Act -- namely, unrealistic assumptions. Much of the revenue to finance the bailout was to come from an assumed 8 percent annual increase in thrift deposits. Unfortunately, such a goal was incompatible with the mandated increase in capital ratios. For most SLAs, because of the industries' well-publicized problems, floating equity issues has not been a viable alternative. Thus, the only alternative left to meet the higher ratios was to shrink in size. This shrinkage was 'helped' by a public more than willing to pull their deposits out of SLAs. Net withdrawals from SLAs occurred at a record rate throughout 1989 and have continued, although the trend has slowed in recent months.

The future of the SLA industry as a separate entity looks bleak; FIRREA either dismantled or placed under commercial bank regulator control most of the functions of supervision and insuring deposits. Further, given the increased number of alternatives available for mortgage origination (most notably, mortgage banks), the growing attention given consumers by commercial banks, the similarity of powers now held by depository institutions and the ever-increasing cost of the bailout, the trend is toward the elimination of the industry

Kaplan (1989) finds that the most prudent survival strategy for thrifts is to either mimic the operations of a well-capitalized commercial bank or to act as a mortgage bank by participating significantly in the secondary mortgage markets. As this study indicates, one of the major differences between Nevada thrifts

and troubled ones in other states is a low capital ratio. In sum, one can expect the continuing shrinkage in the SLA industry until only clones of commercial and mortgage banks remain.

Summary, conclusions and implications

This paper has examined profitability and operating characteristics of FHLBB eleventh district SLAs by comparing their means with those of the rest of the country's associations. Nevada thrifts were also compared with other district thrifts to show that certain SLA strategies could be employed to remain profitable in a volatile environment.

Results indicate that strong regional differences do exist, as 41 of the 52 variables examined show statistically significant differences. Eleventh district associations are markedly less profitable, resulting from a failure to control nearly all expenses, lower rates on loans and higher rates on deposits. Further, balance sheet decomposition revealed that district SLAs borrow more, have a stronger capital position, and a higher reliance on conventional mortgages than the average industry association.

Comparing Nevada SLAs with the rest of the eleventh district thrifts highlighted a narrower group of characteristics, resulting in the district's lower profitability levels. Nevada SLAs were similar to other district thrifts with respect to fee income, interest rates on deposits, and non-interest expense ratios. Higher profitability was achieved through higher rates on loans, controlling nonoperating expenses, and dramatically lower reliances on borrowed monies and brokered deposits.

As with the studies by Smith, Kaplan and Ford (1977), Verbrugge and others (1976, 1978 and 1981) and Rubens (1987), strong regional differences were observed. Further, as indicated by Verbrugge and Goldstein (1978) and Kaplan (1989), these differences can be overcome by prudent management practices. As indicated earlier, the industry has changed dramatically since the advent of deregulation in this decade, yet efficient management is still the key to the successful operation of a SLA.

The implications of this study's findings are two-fold. First, any financial intermediary considering acquiring SLAs in another region must be aware that operating characteristics vary from one location to the next. The acquirer must be prepared to adapt to the environment in which the new branch operates, as a profitable strategy in one area may yield disappointing results in another. Second, although environment appears to play an important factor in both profitability and operating characteristics, efficient management is still the key to the successful operation of a newly acquired association, whatever profile that institution may take.

Note: Exhibits 1 - 5 appear on pages 26 - 28.

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Exhibit 1
Ratios and Ratio Identifiers Used in the Study

Identifier	Ratio	Identifer	Ratio
VAR1	Net Income/Total Assets	VAR26	Total FHLB Advances/Total Liabilities
VAR2	Net Income/Total Regulatory Net Worth	VAR27	Total Borrowed Money/Total Assets
VAR3	Net Income/Total Income	VAR28	Total Regulatory Net Worth/Total Assets
VAR4	Total Income/Total Assets	VAR29	Total Regulatory Net Worth/Total Deposits and Savings Accounts
VAR5	Total Interest, Fees and Service Charges/Total Earning Assets	VAR30	Total Regulatory Net Worth/Total Deposits and Savings Accounts and Total Borrowed Money
VAR6	Total Interest/Total Earning Assets	VAR31	Total Regulatory Net Worth/Total Loans
VAR7	Interest and Discounts Earned on Mortgage Loans and Contracts/Gross Mortgage Loans and Contracts	VAR32	Total Loans/Total Deposits and Savings Accounts
VAR8	Interest on Nonmortgage Loans/Total Non mortgage Loans	VAR33	Total Cash and Investment Securities/Total Deposits and Savings Accounts
VAR9	Interest and Dividends on Investments and Deposits/Total Cash and Investment Securi ties	VAR34	Total Net Nonmortgage Loans/Total Assets
VAR10	Total Loan Fees and Service Charges/Gross Total Loans	VAR35	Total Net Mortgage Loans and Contracts/ Total Assets
VAR11	Net Savings Account Interest/Total Deposits and Savings Accounts	VAR36	Total Broker-Originated Deposits/Total Deposits
VAR12	Expense for Advances and Borrowed Money/ Total Borrowed Money	VAR37	Interest on Mortgage Loans/Total Income
VAR13	Net Savings Account Interest and Expense for Advances and Borrowed Money/Total Deposit and Savings Account and Borrowed Money	VAR38	Interest on Nonmortgage Loans/Total Income
VAR14	Net Interest Income/Total Assets	VAR39	Interest and Dividends on Investments and Deposits/Total Income
VAR15	Total Earning Assets/Total Assets	VAR40	Total Loan Fees and Service Charges/Total Income
VAR16	Gross Mortgage Loans and Contracts/Total Assets	VAR41	Other Income/Total Income
VAR17	Total Conventional Loans/Total Assets	VAR42	Total Operating Expense/Total Assets
VAR18	Gross Nonmortgage Loans/Total Assets	VAR43	Total Director and Employee Expenses/To tal Assets
VAR19	Total Cash and Investment Securities/Total Assets	VAR44	Total Office and Fixture Expense/Total As sets
VAR20	Total Fixed Assets/Total Assets	VAR45	Other Operating Expense/Total Assets
VAR21	Total VA, FHA and HUD Loans/Total Loans	VAR46	Total Director and Employee Expenses/To tal Operating Expense
VAR22	Total Conventional Loans/Total Loan	VAR47	Office Occupancy Expense/Total Operating Expense
VAR23	Total Commercial Loans and Leases/Total Assets	VAR48	Advertising/Total Operating Expense
VAR24	Total Deposits and Savings Accounts/Total Liabilities	VAR49	Net Savings Account Interest/Total Income
VAR25	Total Borrowed Money/Total Liabilities	VAR50	Total Operating Expense/Total Income
		VAR51	Total Nonoperating Expense/Total Income
		VAR52	Total Income Taxes/Total Income

Exhibit 2
Recent Performance Indicators of the Savings and Loan Industry

Year	Total After-Tax Profit (Loss)#	New Net Savings Flow#	Insured SLAs#	Insured SLA Failures*
1978	$3.9 Billion	$23.5 Billion	4,053	2
1979	$3.6 Billion	$15.0 Billion	4,039	3
1980	$0.8 Billion	$10.7 Billion	4,002	35
1981	($4.6 Billion)	($25.4 Billion)	3,779	51
1982	($4.3 Billion)	($6.1 Billion)	3,343	252
1983	$2.0 Billion	$39.8 Billion	3,040	102
1984	$1.1 Billion	$56.9 Billion	2,938	41
1985	$4.0 Billion	($4.3 Billion)	2,944	70

Sources: #United States League of Savings Institutions, *Savings and Loan Sourcebook* (various issues).
*Brumbaugh (1988)

Exhibit 3
Financial Ratio Comparison for the Eleventh FHLBB District Versus All Other Districts for December 1985 (in percent)

Variable	11th District Mean (N = 239)	Other Districts Mean (N = 3034)	*t*-ratio
VAR1	0.23	0.38	4.144*
VAR2	8.13	8.90	3.015*
VAR3	2.27	3.19	3.292*
VAR4	11.97	10.10	-6.205*
VAR5	3.09	3.04	-0.703
VAR6	2.77	2.88	1.745***
VAR7	2.60	2.64	1.497
VAR8	2.69	3.04	1.594
VAR9	1.92	2.16	4.126*
VAR10	0.40	0.20	-11.882*
VAR11	2.11	2.08	-1.743***
VAR12	9.44	5.15	-1.322
VAR13	2.13	2.10	-1.429
VAR14	0.39	0.50	4.298*
VAR15	90.48	89.76	-0.936
VAR16	75.19	74.23	-1.021
VAR17	68.64	65.07	-3.110*
VAR18	3.74	5.57	4.469*
VAR19	16.72	16.62	-0.126
VAR20	1.79	1.42	-5.052*
VAR21	0.35	1.19	4.677*
VAR22	44.26	41.94	-4.672*
VAR23	0.88	0.78	-0.635
VAR24	88.99	92.91	-6.500*
VAR25	8.35	5.50	-5.063*
VAR26	4.65	3.87	-1.954***
VAR27	8.10	5.30	-5.097*
VAR28	5.31	4.18	-2.517*
VAR29	8.74	6.38	-4.660*
VAR30	8.32	6.09	-4.637*
VAR31	4.86	4.74	-0.061
VAR32	186.88	176.90	-3.745*
VAR33	34.37	19.31	-4.757*
VAR34	3.59	5.47	4.736*
VAR35	68.77	71.43	2.999*
VAR36	9.10	15.32	12.580*
VAR37	58.51	63.03	3.920*
VAR38	3.54	5.99	5.404*
VAR39	10.63	12.85	3.173*
VAR40	9.39	4.98	-14.321*
VAR41	2.34	1.88	-1.002
VAR42	0.86	0.56	-10.486*
VAR43	0.38	0.25	-11.755*
VAR44	0.15	0.10	-8.543*
VAR45	0.22	0.14	-4.938
VAR46	45.13	46.18	1.677***
VAR47	9.85	8.11	-5.938*
VAR48	3.29	3.68	2.132**
VAR49	59.49	66.97	5.807*
VAR50	34.67	20.41	-7.628*
VAR51	12.23	6.64	-2.617*
VAR52	-7.93	0.54	2.626*

*Indicates significance at least at the 1 percent level.
**Indicates significance at least at the 5 percent level.
***Indicates significance at least at the 10 percent level.

Exhibit 4
Summary Statistics for Eleventh FHLBB District: December 1985

State	Total Facilities	SLAs	Branches	Deposits per Branch	Branches per SLA
Arizona	280	14	266	$47,307	19.0
California	3,255	218	3,037	57,748	13.9
Nevada	94	7	86	31,170	10.8

Source: *Savings and Loan Sourcebook* (various issues).

Exhibit 5
Financial ratio comparison for Nevada savings and loans versus the Eleventh FHLBB District for December 1985 (in percent)

Nevada Variable (N = 7)	District Mean (N = 232)	11th Nevada Mean (N = 7)	11th District Variable (N = 232)	Mean	Mean
VAR1	0.31	0.23	VAR27	5.81	8.16
VAR2	8.31	8.13	VAR28	3.61	5.51
VAR3	2.67	2.27	VAR29	7.93	8.73
VAR4	11.22	11.97	VAR30	7.55	8.30
VAR5	3.32	3.08	VAR31	3.14	4.81
VAR6	3.03	2.76	VAR32	175.21	187.18
VAR7	2.88	2.60	VAR33	19.60	34.75
VAR8	2.42	2.70	VAR34	6.08	3.52
VAR9	1.73	1.93	VAR35	68.78	68.77
VAR10	0.36	0.40	VAR36	0.89	9.71
VAR11	2.16	2.11	VAR37	54.84	58.92
VAR12	2.75	9.59	VAR38	5.07	3.52
VAR13	2.17	2.13	VAR39	8.71	10.74
VAR14	0.46	0.39	VAR40	7.75	9.48
VAR15	85.34	90.61	VAR41	2.89	2.32
VAR16	73.42	75.24	VAR42	5.87	0.87
VAR17	58.83	68.89	VAR43	0.29	0.38
VAR18	6.00	3.68	VAR44	0.11	0.15
VAR19	16.14	16.73	VAR45	0.13	0.22
VAR20	2.15	1.78	VAR46	48.64	45.04
VAR21	2.15	0.30	VAR47	11.52	9.81
VAR22	38.51	44.41	VAR48	2.45	3.20
VAR23	0.41	0.89	VAR49	64.04	59.84
VAR24	90.19	89.00	VAR50	20.08	35.27
VAR25	6.13	8.41	VAR51	2.30	12.83
VAR26	3.19	4.69	VAR52	1.55	-7.33

Leadership Style: An International Comparison

*by David A. Lewis**

Background

Much has been written about factors which directly affect management style. One factor which significantly affects this style is cultural background. The leadership style impacts on the cultural climate within the company as well as the way individual members interact. For managers to be effective, especially those exposed to a new culture for the first time, it is important that they understand the values of the new cultural system.

Numerous studies which attempted to isolate the effect of culture on international management practices, Ronen (1986) and Weinshall (1977), give good reviews. A subset of these studies look specifically at management style. Haire, et al. (1966) completed the first comprehensive study of the impact of cultural differences on leadership style more than 20 years ago.

Others have built on this pioneering research. (For example, see Bass (1981); Heller, et al., (1981); Barrett and Bass (1976); Bass and Burger (1979), and Hofstede (1980).) Ronen (1986) identifies the chief factors that impact on leadership style in different cultures as differences in values (England (1978); Bass (1981)); need strength (Bass and Burger (1979); Kanungo and Wright (1983)); and the managers' socioeconomic background (Bass (1981)).

Another group of theorists has attempted to cluster countries on attitudinal variables. Haire et al.'s study (1966) was conducted in 16 countries. They found that countries could be grouped or "clustered" based on their responses to an exhaustive questionnaire. Their study was replicated by Badawy (1980) in six Middle Eastern countries. Other authors have developed country clusters based on other variables such as work goals, job fulfillment and job satisfaction. (For example, Redding, (1976); Sirota and Greenwood (1971); Ronen and Kraut (1977); Hofstede (1976)). The current study was conducted in three very diverse countries, Taiwan, Greece, and Puerto Rico, using the portion of Haire's original questionnaire examining leadership style. These countries were chosen primarily due to ease in obtaining the necessary data. The author gathered the Puerto Rican data while working in Puerto Rico while the Greek and Taiwanese data were collected by MBA students from Greece and Taiwan during visits home during the summer of 1987.

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Data Gathering Instrument

To determine a profile of Greek, Puerto Rican, and Taiwanese leadership styles, the questionnaire developed by Haire was replicated in these countries. Leadership style is viewed as a continuum with the two diametrically opposed styles, classical-traditional and participative-democratic, as the endpoints of the scale.

These two styles are based on two opposing viewpoints of human nature. The classical theory assumes that the worker dislikes his work, wishes to avoid responsibility, lacks ambition, and works primarily for financial rewards. By contrast, modern theorists assume that workers do not necessarily dislike their work, can be taught responsibility, are willing to work with each other, and are motivated by more than financial rewards. The viewpoint which a manager brings to the job will affect his day-to-day managing style.

The survey solicited managerial opinions along the four dimensions described above:

1. Attitudes toward belief in average person's capabilities
2. Attitudes toward sharing information
3. Attitudes toward participation
4. Attitudes toward the nature of supervisory controls

A total of eight questions covering the above four dimensions were asked with two questions relating to each of the dimensions. Respondents were asked to indicate their degree of agreement with individual statements relating to the four dimensions of leadership philosophy on a 1-5 scale, one representing strong agreement and five strong disagreement. In addition, the following demographic data were collected from each respondent in the sample: their age and education, how long they had been working in industry, and the size of the company they were working for. The questionnaire was translated into Chinese for use in Taiwan, an original Spanish translation used in Puerto Rico, and the original English version was used to gather the Greek data. The English version of the questionnaire is found in Figure 1. The Chinese and Spanish versions are available from the author.

Data Gathering

Approximately 400 completed questionnaires were obtained. A variety of distribution techniques were used. Table 1 indicates the method of questionnaire distribution and response rates for each of the three countries.

The Puerto Rican sample was generated from a sample taken at random from the Puerto Rican business directory (FOMENTO).

FIGURE 1
Managerial Leadership Survey

Managers respond on a scale of 1-5. One (1) representing strong agreement and five (5) representing strong disagreement.

Capacity for Leadership

1. ___The average human being prefers to be directed, wishes to avoid responsibility, and has little ambition.
2. ___Leadership skills can be acquired by most people regardless of their particular inborn traits and abilities.

Sharing Information and Objectives

3. ___A good leader should give detailed and complete instructions to his subordinates, rather than giving them merely general directions and depending upon their initiative to work out the details.
4. ___A supervisor should give his subordinates only that information which is necessary for them to do their immediate tasks.

Participation

5. ___In a work situation, if the subordinates cannot influence me then I lose some of my influence on them.
6. ___Group goal-setting offers advantages that cannot be obtained by individual goal-setting.

Internal Control

7. ___The use of rewards (pay, promotion, etc.) and punishment (failure to promote, etc.) is not the best way to get subordinates to do their work.
8. ___The supervisor's authority over his subordinates in an organization is primarily economic.

Background questions

1. What is your age? _____
2. How many employees are in your organization? _____
3. How many years of formal schooling have you had? _____
4. How long have you been working? _____

Surveys were sent only to managers of Puerto Rican origin in companies representing primarily the manufacturing sector. The Taiwanese sample consisted of two parts. Ten questionnaires were hand-delivered to high level managers in 32 manufacturing companies (for a total of 320) in greater Taipei who then distributed the questionnaires to other managers within their company. The remainder of the questionnaires (200) were distributed by mail by a local marketing research firm. These businesses were relatively small in size and located throughout Taiwan.

The Greek sample was obtained through personal contacts. Questionnaires were distributed at professional society meetings in the Athens area.

Although none of the samples were scientifically obtained, a broad spectrum of managers are represented as illustrated in Table 2.

Table 1
Sample Population

Country	Method of Distribution	Usable Responses	Response Rate
Puerto Rico	Mail	60	35%
Greece	Personal contact	67	85%
Taiwan	Mail	51	25%
"	Personal contact	211	65%

Table 2
Respondent Background

Category		% of Respondents		
		Taiwan (N=243)	Greece (N=67)	Puerto Rico (N=60)
Age	Under 27	10.1%	6.7%	1.5%
	28-36	43.3%	56.7%	23.5%
	37-55	43.8%	33.3%	66.2%
	Over 55	2.9%	3.3%	8.8%
Education	Less than high school	6.3%	0.0%	5.9%
	High school graduate	38.0%	0.0%	1.5%
	Some college	23.1%	0.0%	7.4%
	College graduate	32.7%	100.0%	80.9%
Work Experience	Fewer than 5 years	26.0%	40.0%	8.8%
	6-10 years	25.0%	23.3%	14.3%
	11-20 years	33.7%	21.7%	32.4%
	More than 20 years	15.4%	15.0%	42.6%
Employees in Firm	1-25	7.2%	8.3%	10.3%
	26-200	13.0%	36.7%	35.3%
	201-500	23.1%	36.7%	36.8%
	501-2,000	33.2%	18.3%	16.2%
	More than 2,000	23.6%	0.0%	1.5%

All of the respondents were middle and upper level managers. It is recognized that the sample is not completely random, thus caution should be used when generalizing the results.

Data Analysis

The results of the questionnaire are summarized below. First, a profile of the leadership style of a typical manager from the three countries was developed. Second, these results are compared to those obtained in Haire's study. Third, the extent than other demographic variables impact on leadership style are examined. Finally, specific cultural characteristics are discussed, to help explain the results obtained.

Country Profiles

Table 3 presents the mean responses to each of the four dimensions of leadership style.

Remembering that a higher score represents a more participative-democratic style, (the indifference value is 3.00), the Taiwanese managers indicated a strong preference for newer leadership theories. It appears that although the Taiwanese outwardly appear to be very reserved, they show a strong belief in worker abilities. By contrast, Puerto Rican managers are more traditional as compared to their Greek and Taiwanese counterparts. Greek managers fall between the two extremes. An analysis of variance described later indicates which differences are significant. A better perspective of the meaning of these mean scores is found by comparing the scores to those in other countries.

Table 3
Profile of the Greek, Puerto Rican, and Taiwanese Managers

Dimension	Mean Score		
	Taiwan	Greece	Puerto Rico
Belief in Average Person's Capability	3.41	2.75	3.02
Sharing of Information	3.39	3.24	3.16
Participation	4.31	3.45	3.16
Nature of Supervisory Controls	3.45	3.52	3.11

Comparison to Other Countries

Table 4 compares the results of the current study to the mean "cluster scores" derived in Haire's original study.

Table 4
Attitudes Toward Management Practices
By Clusters of Countries

Dimension	Country Cluster	Score
Capacity for leadership and initiative	Nordic-European	2.50
	Latin-European	2.50
	GREECE	2.75
	Developing	2.80
	Japan	2.92
	Anglo-American	2.94
	PUERTO RICO	3.02
	TAIWAN	3.41
Sharing information and objectives	Developing	2.92
	PUERTO RICO	3.16
	GREECE	3.24
	TAIWAN	3.39
	Japan	3.60
	Nordic-European	3.60
	Latin-European	3.70
	Anglo-American	3.72
Participation	PUERTO RICO	3.16
	Developing	3.20
	GREECE	3.45
	Nordic-European	3.50
	Anglo-American	3.50
	Japan	3.60
	Latin-European	3.90
	TAIWAN	4.31
Internal Control	PUERTO RICO	3.11
	Developing	3.40
	Japan	3.40
	Anglo-American	3.40
	TAIWAN	3.45
	GREECE	3.52
	Latin-European	3.70
	Nordic-European	3.90

Taiwan does not seem to fall into any one of the clusters. In fact, this set of respondents exhibited higher (more democratic) scores on two of the four dimensions than any of the sixteen countries reported by Haire, et al. (1966). One might expect Greece to fall into one of the European clusters. However, Greek managers seem to fall closest to the developing nation grouping (Argentina, Chile and India). Puerto Rico seems to fall between two clusters, the Anglo-American and Latin European. This is probably due to the interaction with the United States, combining with their Latin heritage. Haire's original study was conducted more than 20 years ago which limits the direct comparison of current results.

Implications of the individual country results are discussed below.

Taiwan

Taiwan is a very small island nation. For it to survive, it has aggressively pursued outside ideas -- sending students abroad and encouraging outside investment. Taiwan has maintained close ties with the United States, which is part of the Anglo-American cluster. Attitudes on three of the four dimensions reflect this. The influence of Japanese attitudes on the other dimension, participation, may be one reason for the high score exhibited by the Taiwanese on this dimension. It is clear that Taiwan should not be classified as a developing country in terms of its leadership style.

Puerto Rico

In Puerto Rico, two different cultures are brought together, an Anglo-American and a Latin-European. It seems that Puerto Rico has been influenced by contrasting forces, the close interaction with the United States on one hand, and its Latin heritage on the other. Without understanding the underlying values of the two cultures and where they are likely to clash, managers working in Puerto Rico are not likely to be completely successful. By some indices, Puerto Rico would be classified as a developing nation. However, from a managerial viewpoint, Puerto Rico does not follow this trend.

Greece

Greek managers responded with a traditional managerial philosophy which is closest to that shown in Argentina, Chile, and India (classified as developing in the original study.) It seems that the traditional values which are associated with Greek personal values carry over into the workplace. Greece will soon be joining the common market. More international trade will surely follow. Greek traditional values may be at odds with those exhibited by its European neighbors; these values should be considered by managers who wish to be completely successful doing business in Greece.

The Importance of Culture

It is hypothesized that an individual's cultural background would be the most important variable in predicting score differences. To test this hypothesis, an analysis of variance was performed with the following variables used:

(1) Country of Origin: Greece, Puerto Rico, or Taiwan;
(2) Age: Old (over 36) or young (36 and under);
(3) Experience: Little (under 10 years) or much (10 years and over)
(4) Size of Firm: Small (under 200 employees), medium (201-500), or large (more than 500); and
(5) Education: College or less than college.

Results indicated that culture of origin differentially predicted evaluations of dimensions 1, 3 and 4. In addition, the size of the company was related to the evaluation of dimension 1 (see Table 5).

No other factors showed distinguishable differences. Managers from smaller companies are more conservative than those in larger companies ($p=.01$) in their belief in the average person's capabilities. It may be those with more

Table 5
Factors Predicting Differences in Leadership Style

Dimension	Predictor Variable	Mean Evaluation			F-Ratio	p
		Taiwan	Puerto Rico	Greece		
1	Culture	3.41	3.02	2.75	12.15	<.001
3	Culture	4.31	3.16	3.46	80.71	<.001
4	Culture	3.45	3.10	3.52	5.99	<.005
1	Company Size	Small 2.95	Medium 3.16	Large 3.43	3.74	<.01

experience have in the past given workers some responsibility, but were not entirely satisfied with how well they accepted this responsibility.

Respondent country of origin clearly influenced attitudes towards employees. Cultural background does have a significant impact on managerial style. An understanding of the underlying characteristics of individual cultures will help to understand why these differences exist.

Cultural Characteristics Impact Management Style

Culture has been confirmed to be an important factor in determining leadership style. In this section, cultural characteristics of Greece, Puerto Rico, and Taiwan will be examined to gather insights into why the responses were obtained. Specifically, educational opportunities, the role of foreigners in the country, work behavior, religious institutions, and the level of economic development in each of the countries will be examined.

Educational Opportunities

Taiwanese stress the importance of education more than the other two countries. Taiwanese students currently comprise the largest group of foreign students in the United States (1989). They probably have had greater exposure to modern motivational management theorists (Maslow, McClelland, etc.) than their Greek and Puerto Rican counterparts. In addition, Taiwan has had close ties to Japan which has shown a consensus style of management. These factors would tend to support a participative/democratic leadership style. Puerto Rico has had close ties to the United States mainland, and more and more Puerto Rican students are taking advantage of U.S. educational opportunities. Of the three countries, Greeks will have had less exposure to newer management philosophies, supporting a more classical/traditional approach to management.

Role of Foreigners in the Culture

One might project that a country which has greater interaction with other countries would be more likely to incorporate the management style of these other countries into their own style. This may help explain the more democratic responses from Taiwan. Taiwan is an island nation. For it to survive, it has more readily looked to other countries for trade. Greece, on the other hand, has been impacted primarily by its southern European neighbors. Thus, one would expect its value structure to be closest to those in the Latin-European subgroup. These results are born out in the survey with Taiwan exhibiting the most participative style and Greece exhibiting more traditional responses. This argument breaks down, though, when viewing the responses from Puerto Rico. It, too, is an island nation which relies heavily on the United States for survival. However, its leadership style remains much more traditional than that practiced and taught in the United States.

Work Behavior

Many sociologists believe that the work environment is an integral part of one's overall social environment. If this is the case, the values, beliefs, and needs which guide an individual's life would also be found at work as exhibited through that individual's work behaviors. Two values which have been shown to be culturally based are respect for authority and whether people are oriented toward the satisfaction of individual or group needs.

An important value exhibited by Puerto Ricans and Greeks is respect for authority. These societies would thus lend themselves more towards a traditional style. An important value of the Chinese is the importance of group consensus. This value would lend itself more towards a more democratic/participative management style.

Ronen (1986) points out that need strength is likely to influence managerial styles. In a society in which safety and security dominate, cautious behavior would dominate. In cultures in which self-actualization is the dominant need, innovative behaviors are much more likely. Those with high safety needs may require a protective superior; those with high esteem needs are more likely to respond to praise; and those with high actualization needs would need greater op-

portunity for participation. Using this argument, one would expect the needs of Taiwanese workers would be primarily those of self actualization while those of Puerto Rico and Greece would be primarily safety and security.

This is inconsistent with at least one earlier study. As reported by Cummings and Schmidt (1972), early work by Mead (1983) finds Greeks to be highly individualistic and self-esteem to be very important. One would expect a tendency towards a democratic leadership style to be effective. The results of the current survey do not reflect this result, as Greek managers tend to be conservative on all dimensions except for the need for supervisory control.

Religious Institutions

The three countries represent three very different and distinct religious traditions: Catholicism in Puerto Rico, Greek Orthodox in Greece, and Confucianism in Taiwan. Alder (1986) identifies six dimensions on which cultural values vary: people's qualities as individuals, their relationship to nature and the world, their relationship to other people, their primary type of activity, and their orientation in space and time. The religious institutions are primary shapers of these orientations. For example, man's relationship with nature and the world. Alder (1986) uses the terms dominant, harmony, and subjugation to describe points on this continuum. Cummings and Schmidt (1972) reported the results of an earlier study by Friedl (1962) that found Greeks are in a constant struggle with nature. This is in contrast to Confucian philosophy which states that man should live in harmony with nature. Puerto Rican's are most likely to challenge nature, being more on the dominant end of the spectrum. Thus, one could speculate that Puerto Rican and Greek managers are more likely to want "to take charge" (traditional style) whereas their Taiwanese counterparts would be the most likely to be more willing to seek the advice of others (participative style).

Ishikawa (1984) suggests that Eastern religions tend to view man as good, whereas Western religions believe that individuals contain elements of good and evil. A traditional management style could thus control the evil in man whereas a participative style would be consistent with the idea that man is inherently good and can be trusted with greater responsibility.

Level of Economic Development

Haire, et al. (1966) identified one cluster of countries as "developing." That is, the common thread linking this group together was the level of economic development. If one was to rank the three countries as to level of industrialization, Taiwan is clearly the most industrialized, with Greece and Puerto Rican at lower levels. In relating leadership style to economic development, one may speculate that the higher the level of industrialization, the more democratic/participative the leadership style. In a more industrialized society, the skill level of workers is likely to be higher, creating higher expectations from workers, thus making a participative/democratic leadership style more successful. Referring back to Haire's original study, it is consistently found that the developing countries to be the most traditional on all four dimensions, a result with which the current study is generally consistent.

Conclusions

The attitudes of local managers should be considered by foreign consultants or multinational managers when they are doing business overseas. By keeping in mind the differences between their personal orientations and those of other countries such as Taiwan, Greece or Puerto Rico, they are more likely to be successful. When compared with other demographic variables, an individual's cultural background is the most important variable in predicting leadership style. Yet, most American managers have had very little exposure to cultural differences. Taiwanese, for example, believe in sharing more information with their employees. When trying to expand into the Far Eastern market or hosting Taiwanese managers, American managers are more likely to be successful if they allow for more group discussions than they normally would.

The three countries studied do not fit neatly into the "clusters" established by Haire, but rather exhibit characteristics of multiple clusters. Taiwanese managers are more democratic across all dimensions, while Greek and Puerto Rican managers tend to be the more traditional.

Culture does influence management practices. By examining individual characteristics of culture one would be better prepared to understand and be successful in a new culture. For example, a country such as Taiwan which has more educational opportunities, more contact with foreigners, is more highly industrialized, and has a group oriented value structure, is more likely to espouse a more participative leadership style. This study confirms that differences in leadership style between nationalities do exist. A recognition of these differences becomes more important as a greater percentage of business is conducted across national boundaries. Very few companies operate solely within one country. We are moving towards a global economy where a majority of business will involve those from different cultures. A recognition and understanding of cultural differences will produce more effective managers and more productive companies.

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Economic Overview: Nevada and the National Economy

*by Thomas F. Cargill**

Introduction

The past several years have witnessed intense debate over economic diversification, government expenditures, and taxes in Nevada. While these issues will occupy much of the attention of the legislature when it convenes in Carson City, Jan. 21, 1991, they have taken a back seat to two questions on everyone's mind. First, is the U.S. economy headed for recession and if so, will it be a "soft" or "hard" landing and, second, how adversely will the Nevada economy be impacted by a downturn in the national economy?

The fact that these questions are even raised in Nevada reflects a fundamental change in Nevada's attitude from the 1970s. Nevada was widely viewed as "recession proof" during the rapid growth of the 1970s when gross gaming revenues averaged 15.5 percent growth per year, industrial employment averaged 7.1 percent growth per year, and personal income averaged 14.1 growth percent per year.

Research at both the Bureau of Business and Economic Research (Cargill, 1982 and Cargill and Raffiee, 1990) and the Federal Reserve Bank of San Francisco (Sherwood-Call, 1988) demonstrated, however, that Nevada is indeed sensitive to the national economy. The slowdown in the Nevada economy in the early 1980s in response to the short, but sharp, national recession (July 1981 to November 1982) convinced most doubters that Nevada was not recession proof. While Nevada's economy has been far more resilient to swings in the national economy than other states and regions, any projection of the Nevada economy for the next two years needs to consider the state of the national economy. This is now widely accepted by policy makers and businesspersons throughout Nevada.

What Is a Business Cycle, and How Do We Know We Are In a Recession?

It has long been recognized that economic activity exhibits periods of expansion followed by periods of contraction. These expansions and contractions, once started, become self-reenforcing and sustaining. They are manifested by almost all measures of economic activity since expansions and contractions are pervasive and impact all major sectors of the national and regional economies.

Despite the difference of opinion over the causes of business cycles, there is no disagreement about the existence of business cycles in the U.S. economy. With this in mind, the National Bureau of Economic Research (NBER), a nonprofit research entity, established a program in the 1920s to date the turning points in economic activity.

The peak of the business cycle represents the point in time when the economy turns from expansion to contraction while the trough represents the point in time when the business cycle turns from contraction to expansion. Table 1 reports the turning points established by the NBER all the way back to 1854. While one often hears that a recession is defined to have occurred when real GNP experiences two quarters of negative growth, the methodology of establishing the turning points in Table 1 involves additional considerations.

The last official turning point experienced by the U.S. economy occurred in November 1982 when the economy emerged – from a very sharp recession (July 1981 to November 1982) that saw the national unemployment rate exceed 10 percent. The official date for the most recent peak has not yet been determined; however, many observers believe the U.S. economy entered a recession phase sometime in early summer 1990. In a recent survey of more than 50 forecasters, 85 percent of those surveyed indicate that a national recession was underway or would soon start (*The Wall Street Journal*, Nov. 28, 1990).

The current downturn is not surprising since the U.S. economy has already experienced an unusually long expansion. Historically, expansions eventually come to an end. Even if June 1990 is declared the official peak in economic activity, the past expansion represents the longest peacetime expansion (90 months) since business cycles were first dated in 1854 and the second longest expansion in economic activity recorded since 1854. The expansion from February 1961 through December 1969 is the longest recorded expansion (106 months); however, this expansion was associated with the Vietnam War.

Even President Bush, with great reluctance, has admitted that the U.S. economy is likely to experience a "slowdown" for a short period in 1991.

The more important question - of how severe and how long the recession will be - is far more difficult to answer. Views range from a mild and short "soft landing" to a severe and long "hard landing," though the majority tend to favor a short recession (9 to 12 months) and few believe that it will be as severe as the July 1981 - November 1982 recession, which had a particularly adverse impact on the Nevada economy.

The range of views reflects the uncertainty over the following elements:

- public confidence in economic policies of the federal government;
- policies adopted by the Federal Reserve;

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Table 1. Business Cycle Expansions and Contractions in the United States, 1854-1982

Business Cycle Reference Dates		Duration (months)[1]	
Trough	Peak	Contraction (trough from previous peak)	Expansion (trough to peak)
December 1854	June 1857		30
December 1858	October 1860	18	22
June 1861	April 1865	8	46
December 1867	June 1869	32	18
Dec 1870	October 1873	18	34
March 1879	March 1882	65	36
May 1885	March 1887	38	22
April 1888	July 1890	13	27
May 1891	January 1893	10	20
June 1894	December 1895	17	18
June 1897	June 1899	18	24
December 1900	September 1902	18	21
August 1904	May 1907	23	33
June 1908	January 1910	13	19
January 1912	January 1913	24	12
December 1914	August 1918	23	44
March 1919	January 1920	7	10
July 1921	May 1923	18	22
July 1924	October 1926	14	27
November 1927	August 1929	13	21
March 1933	May 1937	43	50
June 1938	February 1945	13	80
October 1945	November 1948	8	37
October 1949	July 1953	11	45
May 1954	August 1957	10	39
April 1958	April 1960	8	24
February 1961	December 1969	10	106
November 1970	November 1973	11	36
March 1975	January 1980	16	58
July 1980	July 1981	6	12
November 1982		16	
Average, all cycles			
1854 - 1982 (30 cycles)		18	33
1854 - 1919 (16 cycles)		22	27
1919 - 1945 (6 cycles)		18	35
1945 - 1982 (8 cycles)		11	45
Average, peacetime cycles			
1854 - 1982 (25 cycles)		19	27
1854 - 1919 (14 cycles)		22	24
1919 - 1945 (5 cycles)		20	26
1945 - 1982 (6 cycles)		11	34

[1]Underscored figures are the wartime expansions (Civil War, World Wars I and II, Korean War; and Vietnam War), the postwar contracitons, and the full cycles that include the wartime expansions.

Source: U.S. Department of Commerce, *Business Conditions Digest* (Washington, D.C.: GPO, February, 1984), p. 104.

- financial condition of the thrift and banking systems; and
- sensitivity of the U.S. economy to oil price increases and supply interruptions;

The last element of uncertainty is the most difficult to assess at this time. War with Iraq remains a real possibility as we approach the Jan. 15, 1991 deadline announced by the Bush administration. No one has firm knowledge of what effect war will have on short-run oil prices, oil supplies, and the economy in general. Most observers, though, believe that current world supply and increased energy efficiency make this country less susceptible to oil price increases than it was in the 1970s.

Uncertainty about the severity of the national recession carries over to the near-term growth of the Nevada economy. With this in mind, what can we say about the Nevada economy in 1991 and beyond?

Forecasting the Nevada Economy

Forecasts of key measures of economic activity summarized in *Western Blue Chip Economic Forecast* (Economic Outlook Center, College of Business, Arizona State University) are provided by a number of observers of the Nevada economy. Table 2 and 3 present the consensus forecasts for Nevada and eight other western states, respectively. The forecast period covers the last few months of 1990 and all of 1991. Two considerations are suggested by the consensus forecasts.

First, forecasters have lowered their projections for 1991 compared to 1990, reflecting the widespread view that national economic activity will decline in 1991 relative to 1990 and, second, the Nevada economy continues to be projected as the least impacted by the national slowdown. According to *Western Blue Chip Economic Forecast*: "Nevada seems the most likely to just keep rolling along on the sheer force of established momentum - albeit at a somewhat slower pace - oblivious to problems in the Northeast." (Oct. 1990, p. 1).

The "sheer force of established momentum" during the past year is reflected by rapid increases in gaming revenues, taxable sales, industrial employment, and personal income. Gaming revenue increased 12.8 percent in the third quarter of 1990, compared to one year earlier, while industrial employment increased 7.0 percent in the second quarter compared to one year earlier. As a result, forecasting models project continued but slower growth in the Nevada economy in 1991 and beyond, despite the presence of a slowdown at the national level. The Nevada VAR model, maintained by the Bureau of Business and Economic Research, for example, recently forecasted the following growth rates for 1991:

- Gross gaming revenues 10.3 percent
- Taxable sales 9.8 percent
- Industrial employment 5.3 percent
- Personal income 11.7 percent

One should not, however, be sanguine about the consensus forecasts or the Nevada VAR forecasts.

There are three reasons why the outcome might be more severe than current forecasts suggest. First, the national slowdown could be far more severe than current conditions suggest. Second, if war with Iraq breaks out, all bets are off about short-run oil price increases and supply availability and how these will impact the national and state economies. Third, the Nevada expansion itself may not be as firmly based as recent performance of gaming revenues suggest.

The Las Vegas building boom has been an important driving force of the Nevada expansion and, like any construction-driven expansion, is prone to sudden changes in the cost and availability of credit. The recent stable behavior of interest

Table 2. Nevada Blue Chip Economic Forecast

November 1990	1990 Annual Percent Change, 1990 from 1989					1991 Annual Percent Change, 1991 from 1990				
Source:	Current $ Personal Income	Gross Gaming Revenues	Wage & Salary Empl.	Population Growth	Housing Permits	Current $ Personal Income	Gross Gaming Revenues	Wage & Salary Empl.	Population Growth	Housing Permits
Department of Employment Security		12.0	6.4				8.5	6.4		
First Interstate Bancorp	11.7		6.7			9.7		4.5		
Legislative Counsel Bureau - Fiscal Analysis	10.5		6.0	4.6	(12.0)	9.4		4.4	4.0	(6.0)
Nevada Power Co. (a) (c)	11.6	9.1	7.2	8.3	0.3	11.6	10.3	6.4	7.1	(1.5)
Sierra Pacific Power (b)	8.0	5.0	4.0	4.4	4.6	8.0	5.0	3.0	3.0	(1.0)
Southwest Gas	9.2	11.0	7.2	6.3	(11.4)	9.0	9.0	5.8	5.5	(3.0)
University of Nevada at Las Vegas - CBER	9.9	10.2	8.2	5.5	5.0	8.3	7.0	6.8	4.6	(5.5)
University of Nevada at Reno - BBER (c)	12.3	10.0	7.0	3.9	(20.0)	11.7	10.0	5.3		
Consensus Forecast: This Month	10.7	10.8	6.9	5.1	(9.6)	9.6	8.6	5.5	4.7	(4.8)
Last Month	10.4	10.8	7.0	5.1	(9.6)	9.0	8.7	5.5	4.9	(1.7)

(a) Forecast for Clark Co./ Las Vegas Only - excluded from consensus caluation
(b) Forecast does not include Clark Co./Las Vegas - excluded from consensus calculation.
(c) Forecasts (except population) based on fourth-quarter-to-fourth-quarter changes.

Source: *Western Blue Chip Economic Forecast*, Economic Outlook Center, Arizona State University, November 1990, p. 1.

Table 3. Western Blue Chip Consensus Forecasts

November 1990	1990 Annual Percent Change, 1990 from 1989					1991 Annual Percent Change, 1991 from 1990				
State:	Current $ Personal Income	Real Personal Income	Wage & Salary Empl.	Population Growth	Housing Permits	Current $ Personal Income	Real Personal Income	Wage & Salary Empl.	Population Growth	Housing Permits
Arizona	7.0	2.6	2.9	2.2	(2.0)	7.3	2.7	3.1	2.3	10.7
California	7.1	2.7	2.5	2.3	(21.0)	6.6	1.9	1.3	2.1	(2.2)
Colorado	6.8	2.4	2.1	0.8	8.6	6.8	2.2	2.3	1.1	17.8
Nevada	10.7	6.2	6.9	5.1	(9.6)	9.6	4.9	5.5	4.7	(4.8)
New Mexico	6.6	2.2	2.1	1.5	(9.1)	6.3	1.6	2.0	1.6	20.0
Oregon	7.7	3.3	3.1	1.8	0.3	6.8	2.1	1.9	1.6	(8.6)
Texas	6.7	2.4	1.8	1.2	17.1	6.7	2.1	1.7	1.3	14.5
Utah	7.5	3.1	4.4	1.4	20.3	7.1	2.4	3.3	1.5	7.8
Washington	8.8	4.3	4.3	2.4	(0.9)	6.9	2.2	1.7	1.8	(17.3)

Source: *Western Blue Chip Economic Forecast*, Economic Outlook Center, Arizona State University, November 1990, p. 1.

rates should not be taken as a sign that credit conditions remain unchanged.

There is considerable concern about the quality of bank and thrift loan portfolios both by the regulatory authorities and the institutions themselves. As a result, loan standards have increased significantly in the past few months and are likely to increase further in the near term. These actions reduce the availability of credit and effectively increase its cost even though current interest rates remain relatively stable.

What's the Bottom Line?

The U.S. economy is already experiencing a slowdown and it is probable that the official peak in business activity will be placed sometime around mid-1990. The length and severity of the recession at the national level is unknown at this time and the unique conditions of the current period make it difficult to use past history to predict the nature of the downturn.

In the same vein, the Nevada economy is posed for some type of slowdown, but the uncertainty of the national projection and the same set of unique conditions make it difficult to project the length or degree of the Nevada slowdown.

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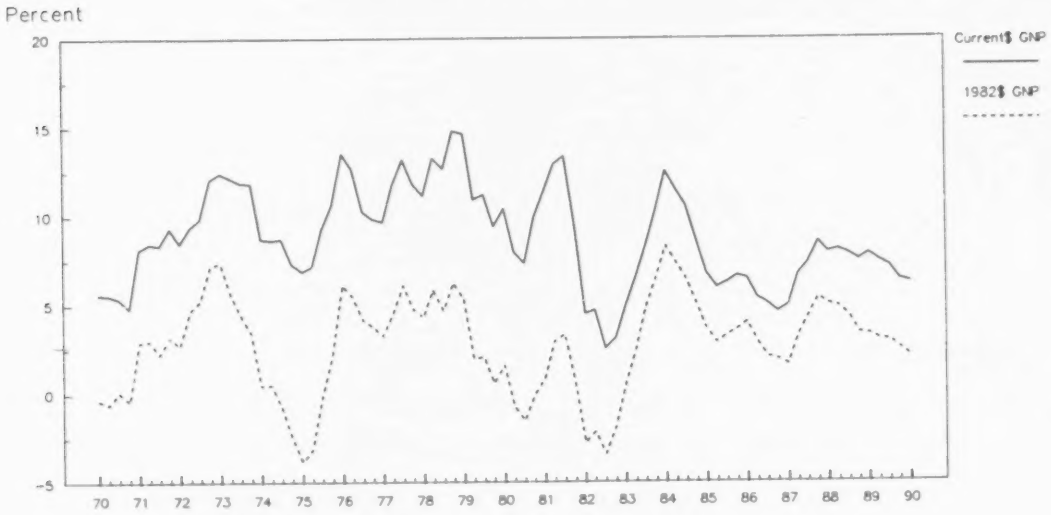
NATIONAL ECONOMIC INDICATORS

GROSS NATIONAL PRODUCT (GNP)

Current and Constant (1982) Dollars, SA

Percent Change from Year-Ago-Quarter



GROSS NATIONAL PRODUCT AND COMPONENTS

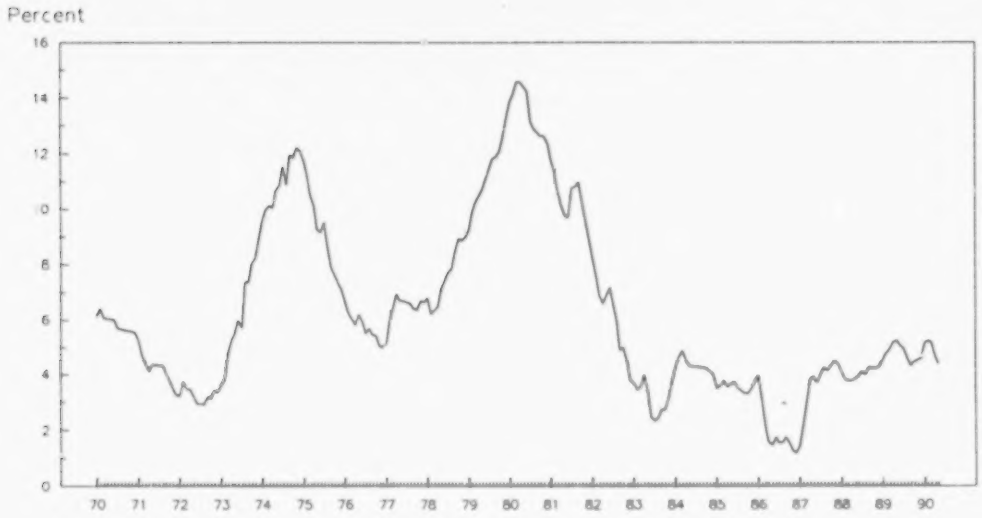
(Billions of Dollars, SA)

Year / Quarter	Gross National Product	Personal Consumption Expenditures	Gross Private Domestic Investment	Government Purchases of Goods and Services	Imports of Goods and Services	Exports of Goods and Services	Gross National Product (1982 $)
1980	2,732.0	1,732.6	436.9	530.3	318.9	351.0	3,187.2
1981	3,052.6	1,915.1	515.5	588.1	348.9	382.8	3,248.7
1982	3,166.0	2,050.7	447.3	641.7	335.6	361.9	3,166.0
1983	3,405.7	2,234.6	502.3	675.0	358.6	352.5	3,279.1
1984	3,772.2	2,430.5	664.8	735.8	442.5	383.5	3,501.4
1985	4,014.9	2,629.0	643.1	820.8	448.8	370.9	3,618.7
1986	4,231.6	2,797.5	659.4	872.2	493.8	396.5	3,717.9
1987	4,515.6	3,009.4	699.6	921.4	564.3	449.6	3,845.3
1988	4,873.7	3,238.2	747.1	962.5	626.1	552.0	4,016.9
1989	5,200.8	3,450.1	771.2	1,025.6	672.3	626.3	4,117.7
1989:1	5,101.3	3,371.7	769.7	1,008.5	658.2	609.7	4,095.7
1989:2	5,174.0	3,425.9	776.7	1,022.7	680.0	628.8	4,112.2
1989:3	5,238.6	3,484.3	775.8	1,027.8	673.0	623.7	4,129.7
1989:4	5,289.3	3,518.5	762.7	1,043.3	678.1	642.8	4,133.2
1990:1	5,375.4	3,588.1	747.2	1,070.1	691.3	661.3	4,150.6
1990:2	5,443.3	3,622.7	759.0	1,086.4	684.6	659.7	4,155.1

CONSUMER PRICE INDEX (CPI): ALL ITEMS

Urban Consumers, SA: 1982–84 = 100

Percent Change from Year-Ago-Month



CONSUMER PRICE INDICES

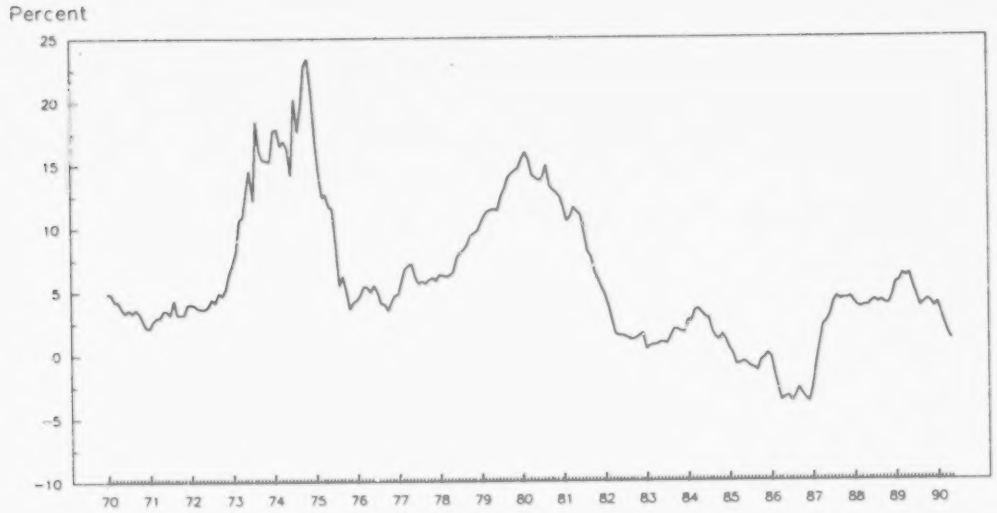
(1982 - 1984 = 100, SA)

Year / Month	Energy	Food & Beverage	Housing	Renter's Cost	All Items	All Items Less: Energy	All Items Less: Food
1980	86.1	86.7	81.0	NA	82.4	81.9	81.4
1981	97.7	93.5	90.4	NA	90.9	90.1	90.3
1982	99.2	97.3	96.9	NA	96.5	96.2	96.3
1983	99.9	99.5	99.5	103.1	99.6	99.6	99.6
1984	100.9	103.2	103.6	108.6	103.9	104.4	104.0
1985	101.5	105.6	107.7	115.3	107.7	108.5	108.0
1986	88.2	109.0	110.9	121.9	109.7	112.7	109.7
1987	88.2	113.5	114.2	127.5	113.7	117.4	113.6
1988	88.9	118.2	118.4	133.0	118.3	122.5	118.2
1989	93.9	124.9	122.9	138.4	124.0	128.3	123.7
1989:7	95.9	125.3	123.3	139.6	124.5	128.6	124.2
1989:8	93.8	125.7	123.5	139.1	124.5	128.8	124.1
1989:9	93.2	126.0	123.7	138.7	124.8	129.2	124.4
1989:10	94.1	126.5	124.2	139.8	125.4	129.8	125.0
1989:11	93.8	127.1	124.7	140.5	125.8	130.3	125.4
1989:12	94.1	127.6	125.2	141.0	126.3	130.8	125.9
1990:1	98.9	129.9	126.1	142.3	127.7	131.8	127.1
1990:2	98.2	130.6	126.3	143.4	128.3	132.6	127.7
1990:3	97.4	131.1	126.9	143.8	128.9	133.3	128.3
1990:4	97.0	130.8	127.0	143.9	129.1	133.6	128.5
1990:5	96.3	130.9	127.2	143.9	129.3	133.8	128.7
1990:6	96.9	131.8	128.0	144.5	130.0	134.6	129.4
1990:7	96.2	132.3	128.6	146.6	130.5	135.3	130.0
1990:8	100.3	132.7	129.5	148.1	131.5	135.9	131.1

PRODUCER PRICE INDEX (PPI): ALL COMMODITIES

1982 = 100

Percent Change from Year-Ago-Month



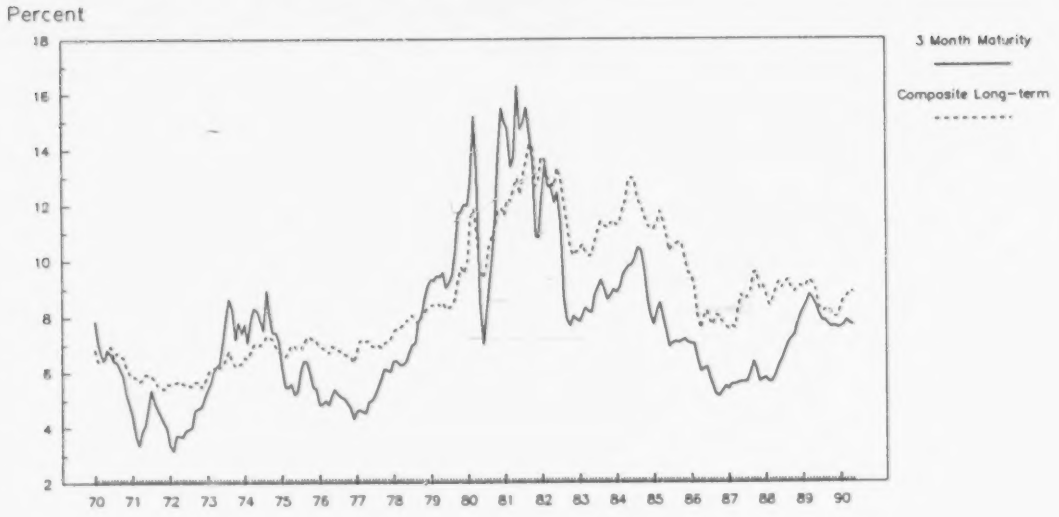
PRODUCER PRICE INDICES (PPI)

(1982 = 100)

Year / Month	ALL COMMODITIES	FINISHED GOODS	INDUSTRIAL COMMODITIES	INTERMEDIATE MATERIALS, SUPPLIES & COMPONENTS
1980	89.8	88.0	88.0	90.3
1981	98.0	96.2	97.4	98.6
1982	100.0	100.0	100.0	100.0
1983	101.3	101.6	101.1	100.6
1984	103.7	103.8	103.3	103.1
1985	103.2	104.7	103.7	102.7
1986	100.2	103.2	100.0	99.1
1987	102.8	105.4	102.6	101.5
1988	106.9	108.0	106.3	107.1
1989:7	112.8	114.1	112.2	112.5
1989:8	112.0	113.4	111.4	112.0
1989:9	112.4	113.6	111.9	112.4
1989:10	112.8	114.9	112.4	112.3
1989:11	112.7	114.9	112.1	112.0
1989:12	113.0	115.4	112.3	111.9
1990:1	114.9	117.6	114.1	113.4
1990:2	114.4	117.4	113.6	112.5
1990:3	114.2	117.2	113.2	112.4
1990:4	114.1	117.2	113.2	112.8
1990:5	114.5	117.7	113.3	112.9
1990:6	114.2	117.9	113.1	112.9
1990:7	114.3	118.0	113.2	113.0
1990:8	116.5	119.2	115.9	114.4

U.S. TREASURY SECURITY RATES

Short Rates vs. Long Rates

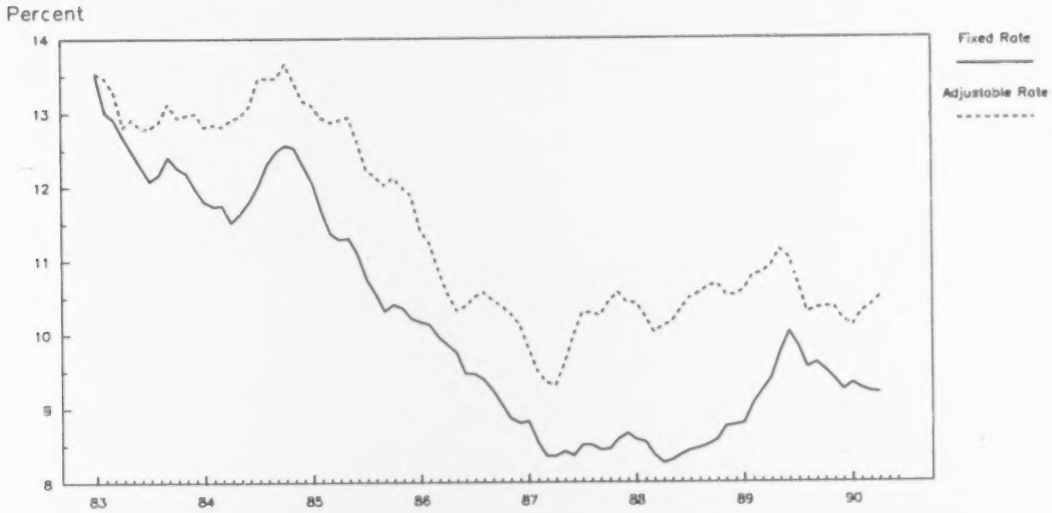


FINANCIAL INDICATORS

Year / Month	Dow Jones Industrial Average	NYSE Common Stock Price Index (12/31/50 = 50)	S & P's Composite Common Stock Dividend Yield (%)	U.S. TREASURY RATES (3 Month) (%)	U.S. TREASURY RATES Composite (Lg Term) (%)	CONVENTIONAL HOME MORTAGE RATES Adjustable (%)	CONVENTIONAL HOME MORTAGE RATES Fixed (%)
1980	891.4	68.1	5.3	11.4	10.8	NA	NA
1981	932.9	74.0	5.2	14.0	12.9	NA	NA
1982	884.4	68.9	5.8	10.6	12.2	NA	NA
1983	1,190.3	92.6	4.4	8.6	10.8	12.5	13.0
1984	1,178.5	92.5	4.6	9.5	12.0	12.0	13.2
1985	1,328.2	108.1	4.2	7.5	10.8	11.0	12.5
1986	1,792.8	136.0	3.5	6.0	8.1	9.5	10.6
1987	2,276.0	161.7	3.1	5.8	8.6	8.5	10.0
1988	2,060.8	149.9	3.6	6.7	9.0	8.5	10.4
1989	2,508.9	180.0	3.5	8.1	8.6	9.5	10.6
1989:7	2,554.0	185.1	3.4	7.9	8.2	9.8	10.7
1989:8	2,691.1	192.9	3.3	7.9	8.3	9.6	10.3
1989:9	2,693.4	193.0	3.3	7.8	8.3	9.6	10.4
1989:10	2,692.0	192.5	3.3	7.6	8.1	9.5	10.4
1989:11	2,642.5	188.5	3.4	7.7	8.0	9.4	10.4
1989:12	2,728.5	192.7	3.3	7.6	8.0	9.3	10.2
1990:1	2,679.2	188.0	3.4	7.6	8.4	9.3	10.1
1990:2	2,614.2	182.6	3.5	7.7	8.7	9.3	10.3
1990:3	2,700.1	186.3	3.5	7.9	8.7	9.2	10.4
1990:4	2,708.3	185.6	3.5	7.8	8.9	9.2	10.5
1990:5	2,793.8	191.4	3.4	7.7	8.9	9.3	10.5
1990:6	2,894.8	196.7	3.4	7.7	8.6	9.3	10.6
1990:7	2,934.2	196.6	3.4	7.6	8.6	NA	NA
1990:8	2,685.0	181.6	3.7	7.4	9.0	NA	NA

CONVENTIONAL HOME MORTGAGE RATES

Fixed Rate vs. Adjustable Rate

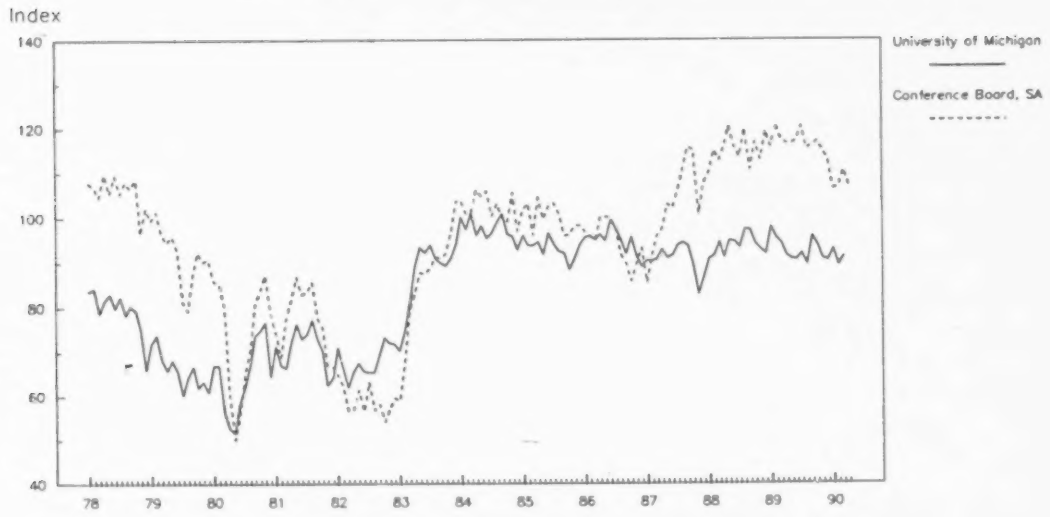


EXCHANGE RATES

Year / Month	FOREIGN EXCHANGE RATES (Units of Foreign Currency = $1.00) CANADA	FRANCE	GERMANY	JAPAN	UNITED KINGDOM	WEIGHTED-AVERAGE EXCHANGE VALUE of U. S. Dollars (March 1973 = 100)
1980	1.17	4.23	1.82	226.53	0.43	87.38
1981	1.20	5.43	2.26	220.45	0.49	103.26
1982	1.23	6.58	2.43	249.05	0.57	116.50
1983	1.23	7.62	2.55	237.45	0.66	125.33
1984	1.30	8.74	2.85	237.59	0.75	138.34
1985	1.37	8.99	2.94	238.47	0.77	143.23
1986	1.39	6.93	2.17	168.50	0.68	112.27
1987	1.33	6.01	1.80	144.63	0.61	96.95
1988	1.23	5.96	1.76	128.14	0.56	92.75
1989	1.18	6.38	1.88	138.00	0.61	98.52
1989:7	1.19	6.41	1.89	140.42	0.61	99.12
1989:8	1.18	6.51	1.93	141.49	0.63	100.44
1989:9	1.18	6.59	1.95	145.07	0.64	101.87
1989:10	1.17	6.33	1.87	142.21	0.63	98.92
1989:11	1.17	6.22	1.83	143.53	0.64	97.99
1989:12	1.16	5.94	1.74	143.69	0.63	94.88
1990:1	1.17	5.76	1.69	144.98	0.61	93.00
1990:2	1.20	5.69	1.68	145.69	0.59	92.25
1990:3	1.18	5.76	1.71	153.31	0.62	94.11
1990:4	1.16	5.66	1.69	158.46	0.61	93.51
1990:5	1.17	5.60	1.66	154.04	0.60	92.04
1990:6	1.17	5.66	1.68	153.70	0.58	92.43
1990:7	1.16	5.49	1.64	149.04	0.55	89.68
1990:8	1.14	5.27	1.57	147.46	0.53	86.55

CONSUMER CONFIDENCE INDICES

University of Michigan (February 1966 = 100)
Conference Board (1985 Average = 100)

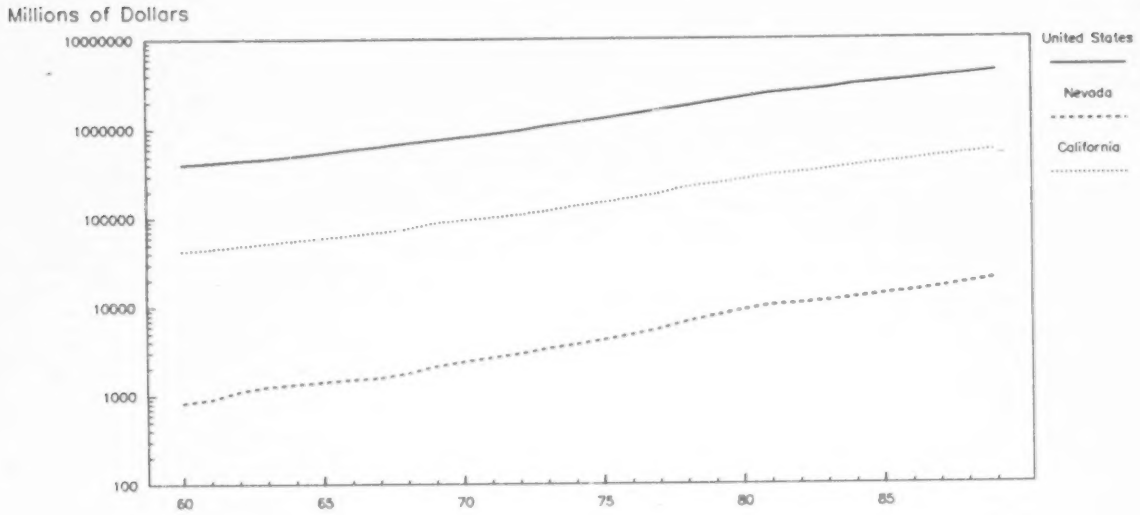


CONSUMER CONFIDENCE INDICES

Year / Month	University of Michigan CONSUMER CONFIDENCE (Feb 1966 = 100)	Conference Board INDEX of CONSUMER CONFIDENCE, SA (1985 = 100)
1980	73.8	64.4
1981	77.4	70.7
1982	59.0	68.0
1983	85.7	87.5
1984	102.3	97.5
1985	100.0	93.2
1986	94.6	94.8
1987	102.6	90.6
1988	115.2	93.7
1989	116.8	92.8
1989:7	120.4	92.0
1989:8	115.4	89.6
1989:9	116.3	95.8
1989:10	117.0	93.9
1989:11	115.1	90.9
1989:12	113.0	90.5
1990:1	106.5	93.0
1990:2	106.7	89.5
1990:3	110.6	91.3
1990:4	107.3	93.9
1990:5	107.3	90.6
1990:6	102.4	88.3
1990:7	101.7	NA
1990:8	83.8	NA

WESTERN REGION and UNITED STATES ECONOMIC INDICATORS

PERSONAL INCOME
United States, Nevada, and California
Semilogarithmic Chart



PERSONAL INCOME: Western Region and United States

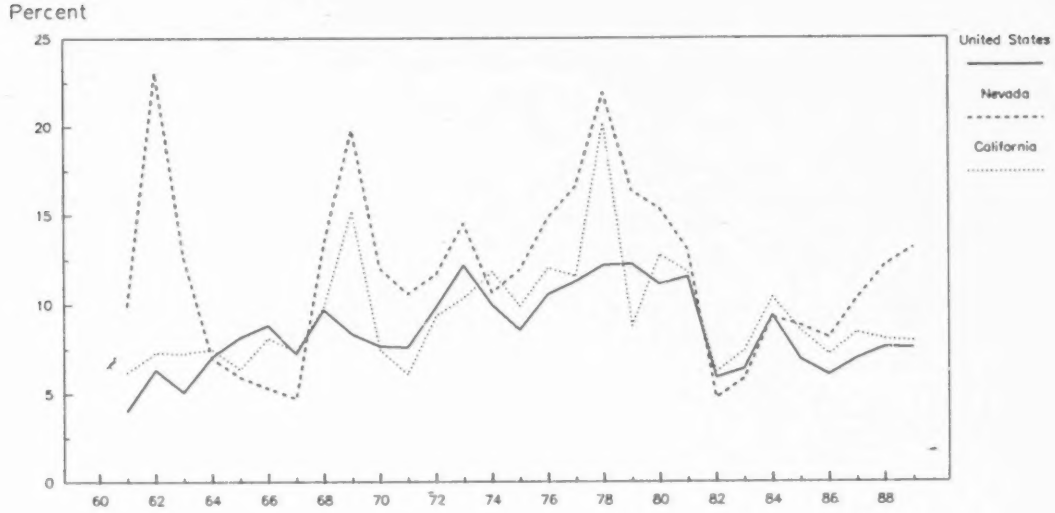
(Millions of Dollars, SA)

Year / Month	ALASKA	ARIZONA	CALIFORNIA	HAWAII	IDAHO	NEVADA	OREGON	UTAH	WASHINGTON	UNITED STATES
1980	5,599.5	25,091.5	276,105.5	10,279.0	8,128.8	9,250.0	26,062.5	11,710.3	44,561.8	2,254,076.0
1981	6,448.8	28,339.0	308,729.5	11,051.8	8,945.8	10,458.8	27,889.5	13,124.5	49,259.5	2,514,231.0
1982	7,739.5	29,756.0	328,032.5	11,731.8	9,079.0	10,956.5	28,262.8	14,091.0	51,420.0	2,663,432.0
1983	8,758.5	32,750.5	352,438.8	12,875.3	9,777.8	11,599.8	30,010.3	14,997.8	54,551.3	2,834,385.0
1984	9,139.8	36,800.5	389,180.5	13,628.3	10,357.3	12,678.8	32,302.3	16,426.3	58,415.8	3,101,163.0
1985	9,801.8	40,963.5	422,604.3	14,588.5	10,868.8	13,801.5	33,951.3	17,512.5	62,031.8	3,317,545.0
1986	9,820.0	44,769.0	453,109.8	15,607.3	11,198.3	14,931.8	35,479.0	18,391.0	66,280.5	3,519,364.0
1987	9,599.0	48,765.3	490,846.8	16,814.8	11,836.5	16,480.3	37,721.3	19,369.8	70,560.3	3,754,396.0
1988	10,093.8	52,233.5	535,720.0	18,459.3	12,686.8	18,821.8	40,990.8	20,674.3	76,131.8	4,058,655.3
1989	11,407.5	56,195.8	579,187.5	20,543.3	13,897.8	21,403.0	44,892.0	22,326.5	84,011.0	4,368,129.0
1989:1	10,758.0	55,123.0	568,003.0	19,764.0	13,652.0	20,591.0	43,463.0	21,680.0	81,419.0	4,287,087.0
1989:2	11,409.0	55,805.0	575,767.0	20,294.0	13,817.0	21,148.0	44,550.0	22,217.0	83,218.0	4,347,177.0
1989:3	11,819.0	56,564.0	584,068.0	20,838.0	13,821.0	21,643.0	45,180.0	22,444.0	84,771.0	4,385,348.0
1989:4	11,644.0	57,291.0	588,912.0	21,277.0	14,301.0	22,230.0	46,375.0	22,965.0	86,636.0	4,452,904.0
1990:1	11,800.0	58,209.0	608,428.0	21,671.0	14,909.0	22,866.0	47,303.0	23,399.0	89,227.0	4,546,227.0
1990:2	12,087.0	59,005.0	618,878.0	22,025.0	14,977.0	23,233.0	48,098.0	23,877.0	90,127.0	4,605,604.0

PERSONAL INCOME

United States, Nevada and California, SA

Percent Change from Previous Year



PERSONAL INCOME: Western Region and United States

(Percent change of SA data)

Year / Quarter	ALASKA	ARIZONA	CALIFORNIA	HAWAII	IDAHO	NEVADA	OREGON	UTAH	WASHINGTON	UNITED STATES
1980	11.51	14.33	12.80	13.83	11.51	15.35	10.16	11.64	12.85	11.12
1981	15.17	12.94	11.82	7.52	10.05	13.07	7.01	12.08	10.54	11.54
1982	20.02	5.00	6.25	6.15	1.49	4.76	1.34	7.36	4.39	5.93
1983	13.17	10.06	7.44	9.75	7.70	5.87	6.18	6.43	6.09	6.42
1984	4.35	12.37	10.43	5.85	5.93	9.30	7.64	9.52	7.08	9.41
1985	7.24	11.31	8.59	7.05	4.94	8.86	5.10	6.61	6.19	6.98
1986	0.19	9.29	7.22	6.98	3.03	8.19	4.50	5.02	6.85	6.08
1987	-2.25	8.93	8.33	7.74	5.70	10.37	6.32	5.32	6.46	6.68
1988	5.15	7.11	9.14	9.78	7.18	14.21	8.67	6.73	7.90	8.10
1989	13.02	7.59	8.11	11.29	9.55	13.71	9.52	7.99	10.35	7.63
1989:1	9.36	8.68	9.87	10.49	11.55	15.43	9.80	8.04	10.36	8.81
1989:2	13.83	7.62	8.73	11.59	10.03	14.11	9.99	8.40	10.34	8.07
1989:3	16.77	6.95	7.52	12.10	7.99	12.82	9.23	7.51	10.43	7.07
1989:4	12.04	7.14	6.46	10.97	8.73	12.66	9.09	8.04	10.26	6.62
1990:1	9.69	5.60	7.12	9.65	9.21	11.05	8.84	7.93	9.59	6.04
1990:2	5.94	5.73	7.49	8.53	8.40	9.86	7.96	7.47	8.30	5.94

CIVILIAN EMPLOYMENT and UNEMPLOYMENT RATES: Western Region and United States

(Thousands)

Year / Month	ALASKA Employment	ALASKA Unemployment Rates	ALASKA Unemployment Rates SA	ARIZONA Employment	ARIZONA Unemployment Rates	ARIZONA Unemployment Rates SA	CALIFORNIA Employment	CALIFORNIA Unemployment Rates	CALIFORNIA Unemployment Rates SA	HAWAII Employment	HAWAII Unemployment Rates	HAWAII Unemployment Rates SA	IDAHO Employment	IDAHO Unemployment Rates	IDAHO Unemployment Rates SA
1980	170.0	10.6		1,186.4	7.2		10,794.2	7.3		418.0	5.0		395.0	8.6	
1981	178.0	10.1		1,187.0	6.6		10,937.3	8.0		427.0	5.6		396.0	8.1	
1982	190.0	11.1		1,204.2	11.0		10,967.2	11.0		430.0	7.2		400.0	11.0	
1983	210.0	11.4		1,261.0	10.0		11,094.6	10.7		442.0	6.8		413.0	10.9	
1984	222.0	11.3		1,370.0	5.2		11,631.0	8.4		445.0	6.1		430.0	7.7	
1985	226.0	10.6		1,381.0	7.0		12,047.8	7.8		452.0	6.0		428.0	8.6	
1986	229.0	12.2		1,476.0	7.5		12,442.5	7.2		468.0	5.1		427.0	9.6	
1987	223.0	12.1		1,511.0	6.7		12,946.6	6.1		494.0	4.1		425.9	8.8	
1988	227.0	10.1		1,556.0	6.7		13,383.8	5.6		502.0	3.2		444.9	6.6	
1989	236.0	7.2		1,617.0	5.5		13,780.0	5.4		511.0	2.5		464.0	5.4	
1989:8	250.2	5.0	5.3	1,598.9	6.6	6.5	13,993.6	4.9	4.9	517.0	1.6	1.6	468.4	5.0	5.2
1989:9	241.6	6.7	7.0	1,609.8	5.5	5.5	13,909.4	5.2	5.2	506.3	2.0	2.0	466.1	4.2	4.3
1989:10	236.3	6.9	6.9	1,625.7	4.9	5.0	14,035.9	4.8	4.8	511.4	2.4	2.4	468.4	4.3	4.5
1989:11	235.4	6.6	6.5	1,630.9	4.5	4.6	13,982.1	5.1	5.2	517.3	2.7	2.7	468.8	4.7	4.7
1989:12	234.4	7.6	7.4	1,629.5	4.2	4.2	13,829.2	5.0	5.0	516.3	2.4	2.5	468.6	4.7	4.6
1990:1	229.4	9.4	8.7	1,608.4	4.6	4.5	13,647.0	5.8	5.8	509.1	3.0	3.0	467.5	6.1	5.8
1990:2	231.1	9.6	9.1	1,615.6	4.9	4.9	13,662.0	5.7	5.6	512.6	3.3	3.3	463.5	7.2	6.9
1990:3	232.2	8.6	8.2	1,611.3	5.3	5.3	13,779.0	5.6	5.5	519.0	3.1	3.1	466.3	7.2	6.9
1990:4	232.1	8.6	8.4	1,628.2	5.3	5.3	13,831.0	5.6	5.5	523.8	2.7	2.7	468.3	7.0	6.9
1990:5	237.8	7.8	7.9	1,633.1	5.7	5.7	13,964.0	5.6	5.6	526.5	2.6	2.6	471.8	6.1	6.2
1990:6	245.4	7.0	7.3	1,650.6	6.2	6.2	14,110.0	5.3	5.3	525.8	3.0	3.0	484.8	5.7	5.8
1990:7	256.0	5.5	6.0	1,625.5	6.4	6.3	14,115.0	6.0	6.1	524.2	2.9	2.9	477.3	5.9	6.1
1990:8	251.8	5.9	6.3	1,628.4	6.0	5.9	14,126.0	5.8	5.8	526.8	2.5	2.5	466.3	5.3	5.4
1990:9	243.3	6.8	7.0	1,658.0	5.4	5.4	13,761.0	6.1	6.2	517.8	2.8	2.8	465.2	4.7	4.9

Year / Month	NEVADA Employment	NEVADA Unemployment Rates	NEVADA Unemployment Rates SA	OREGON Employment	OREGON Unemployment Rates	OREGON Unemployment Rates SA	UTAH Employment	UTAH Unemployment Rates	UTAH Unemployment Rates SA	WASHINGTON Employment	WASHINGTON Unemployment Rates	WASHINGTON Unemployment Rates SA	UNITED STATES Employment	UNITED STATES Unemployment Rates	UNITED STATES Unemployment Rates SA
1980	402.6	6.7		1,189.0	9.0		594.0	6.7		1,828.0	8.5		9,930,275.0	7.7	
1981	430.8	7.7		1,207.0	10.9		604.0	7.1		1,806.0	10.5		10,039,733.3	8.2	
1982	434.0	11.3		1,171.0	13.1		622.0	8.5		1,779.0	13.8		9,952,641.7	10.8	
1983	437.2	11.0		1,195.8	12.1		628.0	10.2		1,838.0	12.6		10,083,358.3	10.6	
1984	457.7	8.5		1,210.0	10.3		658.0	7.0		1,857.0	10.4		10,500,533.3	8.1	
1985	478.5	8.8		1,200.0	9.7		687.0	6.3		1,921.0	8.8		10,714,983.3	7.7	
1986	500.0	6.4		1,245.0	9.2		709.0	6.3		2,018.0	8.9		10,959,750.0	7.5	
1987	521.5	6.7		1,301.0	6.6		709.0	6.8		2,085.0	8.2		11,244,041.7	6.6	
1988	554.3	5.4		1,343.0	6.2		722.0	5.1		2,173.0	6.6		11,496,841.7	5.8	
1989	572.0	5.2		1,391.0	6.0		751.5	4.4		2,300.0	6.6		11,732,583.3	5.6	
1989:8	571.7	4.9	5.0	1,409.8	5.5	5.6	761.8	4.1	4.1	2,340.9	6.3	6.4	11,909,200.0	5.4	5.4
1989:9	572.1	5.2	5.3	1,386.1	5.4	5.4	775.5	3.8	3.8	2,307.1	6.1	6.2	11,749,800.0	5.4	5.4
1989:10	584.7	5.0	5.0	1,391.2	5.3	5.3	773.4	3.6	3.7	2,345.1	5.9	5.9	11,819,400.0	5.3	5.3
1989:11	585.0	4.9	4.9	1,388.3	5.6	5.7	773.5	3.7	3.7	2,325.4	6.3	6.3	11,816,800.0	5.5	5.5
1989:12	586.7	4.6	4.6	1,382.7	5.6	5.5	778.7	4.0	4.1	2,363.6	6.5	6.4	11,769,800.0	5.4	5.4
1990:1	577.7	5.3	5.2	1,375.6	6.2	6.0	758.0	4.6	4.5	2,330.4	7.0	6.8	11,603,700.0	6.3	6.2
1990:2	584.4	5.2	5.1	1,358.5	6.4	6.3	752.5	4.8	4.7	2,372.9	7.0	6.8	11,630,800.0	6.2	6.1
1990:3	588.2	5.2	5.1	1,345.0	6.0	5.9	750.2	5.5	5.4	2,401.8	6.1	6.0	11,709,300.0	5.7	5.6
1990:4	588.0	5.0	5.0	1,379.3	5.2	5.2	745.9	5.5	5.5	2,405.1	5.5	5.5	11,735,900.0	5.5	5.5
1990:5	582.3	5.3	5.3	1,414.0	5.0	5.0	750.3	5.1	5.0	2,391.5	5.6	5.6	11,827,700.0	5.4	5.4
1990:6	594.2	5.1	5.2	1,431.9	5.5	5.6	758.0	5.1	5.1	2,441.6	5.0	5.1	11,960,500.0	5.6	5.7
1990:7	607.3	4.7	4.8	1,424.5	6.1	6.2	763.8	4.6	4.7	2,419.6	5.4	5.5	11,995,400.0	5.8	5.9
1990:8	605.0	4.2	4.3	1,452.0	5.4	5.5	773.1	4.6	4.6	2,412.1	4.9	4.9	11,917,400.0	5.7	5.8

INDUSTRIAL EMPLOYMENT: Alaska

(Thousands of Jobs)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	170.9	6.7	14.0	17.2	29.4	10.6	8.1	30.2	17.7	37.1
1981	187.1	8.9	14.1	18.3	33.2	13.0	8.8	33.5	17.5	39.9
1982	201.9	8.9	12.9	18.6	37.7	16.9	9.9	37.0	17.7	42.4
1983	214.4	8.2	12.1	18.8	41.4	20.7	10.7	39.7	17.7	45.1
1984	225.7	8.7	11.3	19.2	44.5	20.4	12.2	43.0	18.1	48.4
1985	230.7	9.5	12.1	18.7	45.8	18.6	12.8	44.8	17.6	50.8
1986	220.7	9.1	12.6	17.9	43.7	13.4	12.4	43.7	17.6	50.4
1987	210.1	8.8	12.9	17.6	41.1	10.1	11.3	42.5	17.9	47.9
1988	213.7	9.6	15.0	17.4	42.0	9.0	10.7	43.6	17.9	48.6
1989	227.3	10.1	16.0	20.7	44.2	9.8	10.5	47.1	18.4	50.6
1989:8	249.1	10.6	23.5	26.4	47.3	12.7	10.6	50.9	19.0	48.1
1989:9	243.7	10.6	18.3	23.3	46.6	12.9	10.6	49.8	18.9	52.7
1989:10	230.9	10.6	13.8	19.8	45.1	11.8	10.5	47.8	18.7	52.8
1989:11	223.6	10.4	12.5	18.9	44.4	9.5	10.6	46.8	18.6	51.9
1989:12	221.2	9.9	11.6	18.6	44.9	8.1	10.5	46.9	19.0	51.7
1990:1	213.0	9.9	11.3	17.9	42.4	7.0	10.4	45.7	18.4	50.0
1990:2	217.6	10.2	12.1	18.1	42.3	7.1	10.5	46.2	18.4	52.7
1990:3	221.2	10.3	13.6	18.3	42.8	7.9	10.5	46.5	18.4	52.9
1990:4	227.4	10.3	15.4	18.5	43.9	9.0	10.5	47.1	19.0	53.7
1990:5	234.5	10.6	16.7	19.6	45.9	10.9	10.6	48.4	19.3	52.5
1990:6	245.0	11.4	20.1	20.9	48.1	12.6	10.9	51.0	19.5	50.5
1990:7	251.9	11.7	25.8	21.0	48.7	13.2	10.9	51.5	19.6	49.5
1990:8	250.7	12.0	23.7	21.0	48.9	13.5	10.9	51.6	19.2	49.9
1990:9	245.4	11.6	18.1	20.7	48.1	13.3	10.8	50.7	19.1	53.0

INDUSTRIAL EMPLOYMENT: Arizona

(Thousands of Jobs)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	1,014.0	21.0	154.4	51.3	243.0	76.6	58.2	207.7	39.1	162.7
1981	1,040.8	25.0	160.6	54.4	253.3	72.0	60.8	215.3	38.2	161.3
1982	1,029.8	17.7	154.5	56.6	252.6	64.7	62.0	221.8	37.8	162.1
1983	1,077.8	14.3	155.8	57.2	260.9	78.6	65.7	242.2	38.3	164.8
1984	1,181.9	13.1	172.8	59.8	286.3	97.0	72.1	273.2	39.2	168.3
1985	1,278.6	11.9	181.6	62.9	311.1	112.1	81.0	299.9	41.4	176.7
1986	1,341.4	10.9	184.1	66.4	325.2	113.6	89.1	325.9	41.5	184.6
1987	1,386.0	11.4	187.4	71.7	340.5	103.1	94.6	345.3	43.0	189.0
1988	1,419.3	11.9	189.0	74.1	351.3	93.7	94.2	368.0	43.6	193.6
1989	1,457.2	12.2	188.0	76.7	366.7	85.9	92.6	389.0	44.7	201.4
1989:8	1,421.4	12.3	187.8	77.1	360.2	87.9	92.9	383.7	43.8	175.7
1989:9	1,461.9	12.3	188.0	76.9	364.0	87.9	93.0	388.8	45.7	205.3
1989:10	1,483.5	12.2	188.4	77.7	369.5	87.4	93.1	394.6	45.7	214.9
1989:11	1,496.8	12.3	188.5	78.4	377.7	85.3	93.6	398.6	45.7	216.7
1989:12	1,507.1	12.5	188.5	79.6	385.8	83.7	93.7	402.1	45.9	215.3
1990:1	1,481.6	12.7	187.6	78.4	377.9	81.1	93.6	400.6	45.9	203.8
1990:2	1,498.1	12.7	187.5	78.9	376.1	80.5	93.6	405.8	45.9	217.1
1990:3	1,506.2	12.7	187.5	80.1	377.2	81.3	94.1	408.6	46.0	218.7
1990:4	1,510.0	12.7	187.3	80.4	376.5	81.9	94.3	409.7	48.5	218.7
1990:5	1,514.2	12.7	188.1	80.4	376.3	82.6	94.5	408.1	51.3	220.2
1990:6	1,480.5	12.8	189.4	80.5	376.5	84.0	94.6	410.0	47.9	184.8
1990:7	1,468.9	12.3	188.9	80.3	372.2	84.9	94.8	407.6	47.7	180.2
1990:8	1,477.1	12.9	188.8	80.8	372.7	85.7	95.5	406.8	47.8	186.1
1990:9	1,510.1	12.8	188.1	80.8	376.0	85.1	95.6	409.1	47.7	214.9

INDUSTRIAL EMPLOYMENT: California

(Thousands of Jobs)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	9,848.8	43.5	2,018.2	546.3	2,266.9	428.3	623.1	2,158.8	333.8	1,430.1
1981	9,985.3	49.2	2,032.3	554.8	2,301.6	407.6	642.9	2,240.5	327.6	1,428.8
1982	9,810.3	50.4	1,957.7	542.8	2,275.3	349.0	642.4	2,257.7	327.4	1,407.8
1983	9,965.8	48.1	1,946.8	536.9	2,343.9	369.3	661.7	2,332.2	328.0	1,396.4
1984	10,573.8	50.0	2,065.5	554.6	2,507.4	445.2	694.2	2,509.5	334.4	1,413.0
1985	10,979.1	49.9	2,076.1	568.7	2,626.1	496.1	724.5	2,644.8	343.1	1,449.7
1986	11,258.1	42.6	2,069.7	574.6	2,686.4	531.0	763.7	2,751.3	346.3	1,492.5
1987	11,678.5	41.1	2,107.6	582.6	2,761.4	574.6	800.8	2,926.7	349.7	1,534.1
1988	12,103.4	42.0	2,149.2	589.0	2,874.4	603.3	807.3	3,104.1	354.0	1,580.1
1989	12,521.5	41.6	2,158.6	599.5	2,968.4	643.6	836.3	3,271.5	357.1	1,645.1
1989:9	12,591.2	42.0	2,174.1	610.8	2,979.0	671.4	843.4	3,295.9	355.0	1,619.6
1989:10	12,662.5	41.6	2,161.0	609.5	2,993.0	671.1	843.0	3,304.7	354.6	1,684.0
1989:11	12,740.7	41.7	2,153.9	609.6	3,035.4	667.2	846.3	3,321.9	354.6	1,710.1
1989:12	12,804.5	41.9	2,148.6	610.8	3,088.8	663.3	849.7	3,337.2	356.9	1,707.3
1990:1	12,547.7	41.2	2,125.8	600.6	2,972.7	630.9	845.1	3,279.7	352.1	1,699.6
1990:2	12,639.3	41.2	2,132.7	600.9	2,981.6	634.5	848.7	3,327.5	354.1	1,718.1
1990:3	12,732.6	41.8	2,140.0	602.8	2,988.5	642.8	853.5	3,365.5	357.2	1,740.5
1990:4	12,756.2	41.9	2,133.0	604.8	2,992.0	646.4	852.9	3,373.7	367.1	1,744.4
1990:5	12,815.4	41.9	2,130.8	608.2	3,009.7	655.7	854.9	3,381.3	381.9	1,751.0
1990:6	12,870.1	42.0	2,136.5	612.0	3,027.5	663.8	861.6	3,392.4	379.2	1,755.1
1990:7	12,773.0	42.2	2,137.2	613.3	3,032.0	666.6	863.7	3,400.0	373.0	1,645.0
1990:8	12,755.9	41.7	2,147.7	613.6	3,036.2	665.2	864.5	3,415.2	362.4	1,609.4
1990:9	12,823.7	41.4	2,139.0	614.9	3,035.3	660.7	863.2	3,421.4	352.1	1,695.7
1990:10	12,887.7	41.1	2,124.0	614.6	3,048.1	657.0	863.6	3,433.9	349.3	1,756.1

INDUSTRIAL EMPLOYMENT: Hawaii

(Thousands of Jobs)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	404.1	0.0	23.6	31.2	105.3	24.0	32.9	98.5	30.0	59.1
1981	404.8	0.0	23.0	31.9	105.5	21.9	31.7	101.9	30.5	58.6
1982	399.4	0.0	22.4	31.2	104.9	17.9	31.6	101.3	31.6	58.8
1983	406.2	0.0	22.4	31.1	109.9	17.9	31.9	105.0	32.1	59.2
1984	412.7	0.0	21.9	32.0	111.4	15.8	31.9	108.0	32.1	59.8
1985	425.8	0.0	21.9	33.2	115.7	17.2	32.0	112.7	32.4	60.9
1986	438.6	0.0	22.1	34.2	118.0	18.7	33.2	118.8	32.1	61.8
1987	460.0	0.0	21.9	36.8	123.8	21.2	33.7	126.5	32.8	63.3
1988	478.1	0.0	22.0	38.0	127.5	23.4	34.5	133.3	33.9	65.7
1989	504.8	0.0	21.3	40.2	133.0	29.2	35.2	144.6	33.9	67.7
1989:8	507.2	0.0	21.5	40.6	134.4	30.7	35.3	145.8	33.8	65.3
1989:9	502.3	0.0	21.0	40.9	133.1	31.1	35.4	145.8	33.6	61.7
1989:10	510.2	0.0	20.9	41.0	134.0	31.0	35.4	147.0	33.8	67.2
1989:11	517.6	0.0	21.0	41.3	135.5	31.6	35.7	148.6	34.0	70.1
1989:12	518.0	0.0	20.9	41.4	136.3	30.8	35.7	148.2	33.8	71.2
1990:1	510.8	0.0	20.7	41.3	134.2	30.2	35.4	148.4	33.5	67.3
1990:2	516.8	0.0	20.7	41.6	134.6	30.2	35.6	149.8	33.3	71.1
1990:3	517.7	0.0	20.7	41.8	135.0	29.8	35.7	147.5	33.4	74.0
1990:4	520.7	0.0	20.7	42.1	134.0	29.5	35.7	150.6	33.8	74.3
1990:5	521.2	0.0	20.5	41.8	133.8	29.4	35.8	150.2	34.7	75.1
1990:6	520.8	0.0	20.8	41.9	134.6	29.3	36.0	150.9	34.7	72.6
1990:7	518.2	0.0	20.9	42.2	136.1	29.2	36.2	151.1	34.6	68.1
1990:8	516.9	0.0	20.9	41.7	135.2	29.3	36.3	151.7	34.0	68.0
1990:9	510.8	0.0	20.5	41.8	134.1	29.4	36.3	151.4	33.7	63.7

INDUSTRIAL EMPLOYMENT: Idaho

(Thousands of Jobs)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	330.0	4.7	53.3	20.1	80.6	17.4	23.4	60.0	13.1	57.5
1981	327.8	2.5	52.7	20.0	80.7	16.7	23.1	60.1	12.5	56.7
1982	312.2	3.8	47.8	19.0	78.0	13.8	22.7	59.3	12.0	55.8
1983	317.9	4.1	50.3	19.1	79.4	13.1	23.0	61.0	11.9	55.9
1984	330.5	4.2	54.8	19.1	83.0	14.6	23.5	62.5	11.8	57.1
1985	335.9	3.8	52.1	19.3	84.2	15.1	23.7	65.1	11.8	58.3
1986	333.6	2.9	54.1	18.5	83.6	14.6	23.9	67.1	11.8	59.1
1987	333.5	2.6	58.1	17.9	84.9	13.5	19.2	68.1	12.0	61.4
1988	348.7	3.3	60.6	18.6	87.0	14.5	19.4	72.1	12.7	62.9
1989	367.4	3.6	57.8	19.1	94.3	16.0	19.3	76.3	12.9	65.2
1989:8	371.2	3.9	61.5	19.7	96.7	18.2	19.6	78.4	14.4	58.8
1989:9	381.7	3.8	64.0	19.9	97.1	18.0	19.5	79.2	14.4	65.8
1989:10	383.2	3.9	63.6	19.8	97.9	18.0	19.5	78.1	13.6	68.8
1989:11	381.3	3.8	62.6	19.4	98.7	17.7	19.5	77.7	13.2	68.7
1989:12	380.1	3.7	62.8	19.4	99.5	17.0	19.6	77.1	12.9	68.1
1990:1	372.2	3.7	61.6	19.1	96.8	15.8	19.3	76.4	12.1	67.4
1990:2	373.2	3.7	61.6	19.0	96.0	15.4	19.3	77.3	11.9	69.0
1990:3	375.5	3.8	60.3	18.9	96.7	15.8	19.5	78.2	12.1	70.2
1990:4	379.6	3.8	60.2	19.0	98.0	17.2	19.5	79.0	12.5	70.4
1990:5	383.6	3.8	61.9	19.2	99.0	17.8	19.7	78.5	12.9	70.8
1990:6	389.2	3.9	63.8	19.6	100.0	19.4	19.9	79.9	14.8	67.9
1990:7	384.4	4.0	63.3	19.5	99.8	20.2	19.8	80.8	14.6	62.4
1990:8	388.2	4.0	64.2	19.9	101.2	21.1	19.9	81.5	14.3	62.1
1990:9	399.1	4.0	65.1	20.4	101.9	21.2	19.9	82.6	14.2	69.8

INDUSTRIAL EMPLOYMENT: Nevada

(Thousands of Jobs)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	400.0	6.2	19.2	24.1	80.3	26.2	17.9	169.2	10.4	46.6
1981	411.1	7.9	20.1	25.1	83.6	25.4	18.3	173.7	9.5	47.6
1982	401.1	6.6	18.8	24.9	79.9	20.0	17.9	174.8	9.7	48.5
1983	402.8	5.8	19.2	24.5	80.2	19.4	18.5	177.2	9.8	48.2
1984	426.0	6.6	21.0	24.9	85.9	21.8	20.0	186.9	10.0	49.0
1985	446.4	6.1	22.0	25.3	90.9	23.9	21.4	196.4	10.5	50.1
1986	468.1	6.3	22.3	26.5	94.7	27.7	22.4	206.6	10.9	50.7
1987	500.2	8.1	23.3	27.8	102.2	30.1	23.4	221.2	11.3	52.8
1988	537.6	11.1	24.9	29.0	109.8	36.3	24.5	235.1	11.4	55.6
1989	582.3	13.6	25.4	30.6	119.7	45.6	25.5	251.1	11.7	59.0
1989:8	593.7	14.3	25.8	30.7	122.2	49.1	26.0	259.3	12.0	54.3
1989:9	599.7	14.1	25.7	31.4	123.0	49.9	26.1	258.4	11.8	59.3
1989:10	601.8	14.2	25.6	31.4	123.5	50.3	26.0	257.0	11.8	62.0
1989:11	605.5	14.3	25.7	31.5	125.1	49.9	26.0	258.9	11.7	62.4
1989:12	606.3	14.4	25.7	31.6	126.6	49.1	25.9	258.7	11.7	62.6
1990:1	601.2	14.3	25.4	31.0	123.1	47.4	26.1	260.7	11.6	61.6
1990:2	602.9	14.4	25.7	31.1	123.0	47.1	26.3	260.6	11.6	63.1
1990:3	608.0	14.6	25.9	31.6	123.7	48.0	26.5	262.3	11.7	63.7
1990:4	612.8	14.8	26.0	32.0	125.0	48.9	26.6	264.3	11.7	63.5
1990:5	618.1	15.1	26.2	32.2	126.1	49.9	27.2	265.7	11.9	63.8
1990:6	624.0	15.5	26.3	32.3	127.9	51.2	27.4	269.5	12.1	61.8
1990:7	627.3	15.9	26.4	32.3	129.0	52.3	27.5	273.4	12.3	58.2
1990:8	632.5	15.8	26.4	32.6	130.1	53.0	27.7	276.4	12.2	58.3
1990:9	640.5	15.6	26.3	32.5	131.8	53.7	27.9	275.9	12.3	64.5

INDUSTRIAL EMPLOYMENT: Oregon

(Thousands of Jobs)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	1,044.5	2.3	215.2	60.5	255.5	46.5	70.0	191.4	30.8	172.4
1981	1,018.7	2.2	202.8	59.5	253.4	37.6	68.5	192.2	29.5	173.0
1982	961.1	1.8	185.8	56.8	238.7	28.9	65.0	188.6	29.1	166.4
1983	966.7	1.6	188.8	55.4	242.6	27.0	64.5	194.6	29.0	163.2
1984	1,006.9	1.6	201.1	57.1	253.0	30.2	65.4	204.5	29.3	164.8
1985	1,030.0	1.5	199.3	57.3	258.6	33.1	66.8	215.6	29.6	168.1
1986	1,058.5	1.4	198.4	57.2	267.3	34.3	69.5	230.2	29.6	170.6
1987	1,100.1	1.4	206.2	58.5	276.7	35.3	72.1	244.4	30.5	175.1
1988	1,156.0	1.3	214.2	60.5	292.4	39.9	73.3	263.2	31.7	179.6
1989	1,206.6	1.4	217.2	62.9	309.6	45.2	75.3	279.9	32.2	182.9
1989:8	1,218.9	1.6	229.7	63.2	316.2	49.6	76.8	284.1	33.5	164.2
1989:9	1,231.0	1.6	226.9	64.2	319.4	49.7	76.0	285.9	33.6	173.7
1989:10	1,237.4	1.5	222.4	63.9	319.2	49.2	75.7	284.4	32.9	188.2
1989:11	1,235.2	1.4	217.5	64.2	323.9	47.1	75.5	282.7	32.4	190.5
1989:12	1,230.1	1.4	216.2	65.2	324.8	45.1	75.4	281.1	32.9	188.0
1990:1	1,208.0	1.2	213.5	63.5	312.3	42.6	75.3	280.0	32.2	187.4
1990:2	1,210.0	1.2	212.7	64.0	308.7	41.3	75.3	284.0	31.6	191.2
1990:3	1,225.4	1.3	214.1	64.0	312.4	45.4	75.6	287.9	32.2	192.5
1990:4	1,237.1	1.3	213.8	64.0	316.2	48.9	75.5	290.7	34.3	192.4
1990:5	1,252.6	1.4	216.4	64.4	319.0	50.1	76.6	292.5	36.3	195.9
1990:6	1,261.5	1.4	221.4	64.6	323.0	50.3	77.3	291.0	37.0	195.5
1990:7	1,244.6	1.5	226.3	63.7	325.1	52.3	78.1	292.0	35.5	170.1
1990:8	1,259.4	1.5	230.3	64.6	333.8	53.5	77.9	294.6	34.3	168.9
1990:9	1,263.0	1.6	226.7	64.3	329.7	53.7	78.0	295.0	34.0	180.0

INDUSTRIAL EMPLOYMENT: Utah

(Thousands of Jobs)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	554.1	18.3	88.6	34.7	129.0	31.9	25.9	99.6	37.3	88.8
1981	557.8	20.2	89.5	34.5	130.2	28.3	26.4	103.7	37.1	87.9
1982	558.9	18.2	85.8	35.4	131.8	26.9	26.6	108.6	37.3	89.1
1983	566.9	14.0	85.5	36.0	133.5	28.8	27.4	112.5	37.1	91.7
1984	601.2	12.8	94.0	36.3	140.8	34.8	29.8	121.1	37.5	94.1
1985	624.4	9.7	94.0	37.0	147.9	35.5	31.1	131.3	39.4	98.4
1986	634.1	7.8	92.0	37.6	152.4	32.2	32.9	138.0	40.4	100.8
1987	640.0	8.0	92.1	37.8	152.8	26.7	33.8	147.4	39.9	101.6
1988	660.0	8.1	99.0	39.3	156.7	24.9	33.3	155.9	39.4	102.4
1989	690.8	8.1	102.6	41.3	166.2	26.2	33.3	167.1	40.2	105.9
1989:8	692.0	8.2	103.6	41.8	169.0	28.8	33.6	169.3	40.5	97.2
1989:9	705.5	8.5	103.9	42.4	170.2	29.2	33.6	172.5	40.3	104.9
1989:10	706.1	8.5	103.9	42.6	169.5	28.9	33.5	171.4	40.2	107.6
1989:11	710.1	8.4	104.2	42.9	172.1	28.3	33.5	171.4	39.9	109.4
1989:12	713.6	8.4	103.9	43.2	176.6	26.8	33.8	172.8	39.9	108.2
1990:1	694.6	8.3	102.0	41.8	168.9	22.5	33.3	169.3	39.9	108.6
1990:2	698.2	8.4	103.1	41.9	167.8	21.6	33.4	172.2	39.7	110.1
1990:3	708.2	8.4	103.6	41.9	170.5	23.8	33.8	175.6	40.0	110.6
1990:4	715.3	8.6	104.5	42.4	171.5	25.5	33.8	177.1	40.8	111.1
1990:5	723.4	8.7	105.3	42.6	175.6	27.3	34.1	176.0	41.4	112.4
1990:6	731.0	8.8	106.7	43.3	178.3	28.9	34.4	179.7	40.6	110.3
1990:7	719.2	8.7	106.6	43.2	177.1	29.0	34.4	178.9	40.2	101.1
1990:8	723.4	8.8	107.4	43.1	178.1	29.5	34.6	180.8	39.5	101.5
1990:9	736.9	8.7	107.7	43.6	178.9	29.8	34.4	184.4	39.5	109.9

INDUSTRIAL EMPLOYMENT: Washington

(Thousands of Jobs)

Year/ Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE / LOCAL
1980	1,608.3	3.2	308.7	91.4	381.3	92.6	91.8	308.5	67.9	262.9
1981	1,612.0	3.1	303.3	90.1	379.9	90.3	92.3	318.3	66.5	260.0
1982	1,568.6	3.0	289.0	89.0	385.4	76.2	90.7	316.9	66.3	252.2
1983	1,586.2	2.7	278.4	87.9	393.9	74.2	92.3	332.8	67.6	256.4
1984	1,659.9	2.6	288.1	91.2	411.6	79.6	95.7	356.6	68.9	265.6
1985	1,710.4	2.7	295.5	93.6	420.6	80.6	99.6	391.1	70.1	272.7
1986	1,769.9	2.9	305.1	96.2	436.5	84.5	104.9	391.0	69.2	279.6
1987	1,851.8	3.0	318.4	98.5	457.6	88.9	107.5	420.7	70.6	286.6
1988	1,935.5	3.3	338.6	101.5	475.2	96.0	109.8	444.3	71.6	295.3
1989	2,045.3	3.6	361.3	107.9	500.9	106.5	112.3	473.4	72.0	307.4
1989:8	692.0	8.2	103.6	41.8	169.0	28.8	33.6	169.3	40.5	97.2
1989:9	705.5	8.5	103.9	42.4	170.2	29.2	33.6	172.5	40.3	104.9
1989:10	706.1	8.5	103.9	42.6	169.5	28.9	33.5	171.4	40.2	107.6
1989:11	710.1	8.4	104.2	42.9	172.1	28.3	33.5	171.4	39.9	109.4
1989:12	713.6	8.4	103.9	43.2	176.6	26.8	33.8	172.8	39.9	108.2
1990:1	694.6	8.3	102.0	41.8	168.9	22.5	33.3	169.3	39.9	108.6
1990:2	698.2	8.4	103.1	41.9	167.8	21.6	33.4	172.2	39.7	110.1
1990:3	708.2	8.4	103.6	41.9	170.5	23.8	33.8	175.6	40.0	110.6
1990:4	715.3	8.6	104.5	42.4	171.5	25.5	33.8	177.1	40.8	111.1
1990:5	723.4	8.7	105.3	42.6	175.6	27.3	34.1	176.0	41.4	112.4
1990:6	731.0	8.8	106.7	43.3	178.3	28.9	34.4	179.7	40.6	110.3
1990:7	719.2	8.7	106.6	43.2	177.1	29.0	34.4	178.9	40.2	101.1
1990:8	723.4	8.8	107.4	43.1	178.1	29.6	34.6	180.8	39.5	101.5
1990:9	736.9	8.7	107.7	43.6	178.9	29.8	34.4	184.4	39.5	109.9

INDUSTRIAL EMPLOYMENT: United States

(Thousands of Jobs, SA)

Year / Month	TOTAL	MINING	MANU-FACTURING	TRANS-PORTATION	TRADE	CONSTRUCTION	F. I. R. E.	SERVICE	GOVERNMENT FEDERAL	GOVERNMENT STATE/LOCAL
1980	90,416.8	1,026.8	20,287.2	5,146.6	20,310.5	4,352.6	5,160.3	17,889.5	2,866.6	13,376.3
1981	91,159.8	1,123.7	20,171.4	5,165.2	20,547.1	4,192.7	5,297.7	18,617.9	2,771.8	13,257.3
1982	89,569.1	1,128.1	18,782.4	5,082.8	20,456.4	3,908.3	5,341.4	19,035.3	2,738.4	13,096.0
1983	90,187.9	952.0	18,433.9	4,953.9	20,876.1	3,944.1	5,467.8	19,691.7	2,773.5	13,094.8
1984	94,487.2	965.4	19,379.8	5,158.5	22,096.6	4,380.1	5,688.6	20,795.8	2,807.3	13,215.6
1985	97,516.6	926.6	19,260.8	5,237.8	23,070.8	4,671.8	5,955.8	21,998.8	2,875.3	13,519.1
1986	99,521.9	777.4	18,962.4	5,254.6	23,682.3	4,817.4	6,282.8	23,052.8	2,899.3	13,792.8
1987	102,196.8	717.3	19,022.4	5,371.8	24,327.0	4,966.5	6,547.1	24,235.3	2,943.1	14,066.3
1988	105,534.9	713.0	19,351.3	5,527.1	25,132.3	5,108.4	6,648.5	25,668.5	2,970.8	14,414.9
1989	108,414.2	699.7	19,427.3	5,647.9	25,851.0	5,199.3	6,723.7	27,095.3	2,988.0	14,782.0
1989:9	108,868.0	709.0	19,370.0	5,656.0	25,937.0	5,225.0	6,753.0	27,335.0	2,992.0	14,891.0
1989:10	108,980.0	710.0	19,334.0	5,671.0	25,978.0	5,239.0	6,756.0	27,408.0	2,986.0	14,898.0
1989:11	109,245.0	716.0	19,306.0	5,693.0	26,049.0	5,258.0	6,774.0	27,548.0	2,982.0	14,919.0
1989:12	109,383.0	718.0	19,284.0	5,776.0	26,054.0	5,216.0	6,785.0	27,623.0	2,977.0	14,950.0
1990:1	109,654.0	723.0	19,171.0	5,790.0	26,163.0	5,294.0	6,794.0	27,721.0	3,000.0	14,998.0
1990:2	109,958.0	727.0	19,244.0	5,804.0	26,115.0	5,368.0	6,817.0	27,842.0	3,005.0	15,036.0
1990:3	110,122.0	729.0	19,217.0	5,808.0	26,125.0	5,313.0	6,821.0	27,950.0	3,089.0	15,070.0
1990:4	110,177.0	734.0	19,190.0	5,809.0	26,141.0	5,256.0	6,823.0	27,969.0	3,151.0	15,104.0
1990:5	110,617.0	738.0	19,167.0	5,833.0	26,164.0	5,286.0	6,838.0	28,094.0	3,346.0	15,151.0
1990:6	110,829.0	744.0	19,148.0	5,846.0	26,205.0	5,270.0	6,844.0	28,225.0	3,338.0	15,209.0
1990:7	110,740.0	745.0	19,131.0	5,841.0	26,225.0	5,229.0	6,842.0	28,287.0	3,164.0	15,276.0
1990:8	110,613.0	735.0	19,084.0	5,846.0	26,222.0	5,194.0	6,852.0	28,387.0	3,045.0	15,248.0
1990:9	110,561.0	736.0	19,017.0	5,868.0	26,199.0	5,183.0	6,852.0	28,407.0	3,007.0	15,292.0
1990:10	110,493.0	735.0	18,956.0	5,877.0	26,140.0	5,103.0	6,853.0	28,500.0	2,992.0	15,337.0

RESIDENTIAL CONSTRUCTION CONTRACTS: Western Region and United States

(Millions of Dollars)

Year / Month	ALASKA	ARIZONA	CALIFORNIA	HAWAII	IDAHO	NEVADA	OREGON	UTAH	WASHINGTON	UNITED STATES
1980	137.6	1,609.2	8,653.1	569.9	293.7	690.1	879.6	461.7	1,674.8	63,327.0
1981	161.6	1,569.2	7,492.5	377.3	225.5	737.5	677.7	578.9	1,386.8	59,911.0
1982	321.1	1,625.7	5,926.6	372.6	190.8	613.5	486.3	476.4	1,117.5	58,747.9
1983	535.1	2,900.6	11,180.9	365.7	314.5	918.6	708.0	788.1	1,617.6	90,742.3
1984	531.5	3,610.5	13,944.3	383.4	312.9	795.6	782.2	789.3	1,897.7	101,119.1
1985	433.3	3,703.5	15,278.1	408.2	313.9	807.3	718.5	732.3	1,809.9	108,380.3
1986	286.1	3,490.7	19,708.6	515.1	267.3	936.3	705.8	720.7	2,074.8	122,352.0
1987	160.5	2,819.1	19,372.9	572.5	254.5	1,069.1	785.7	633.4	2,140.8	119,426.5
1988	126.4	2,508.1	21,296.9	644.2	270.6	1,260.2	933.4	577.1	2,307.5	121,989.4
1989	128.8	2,148.4	22,229.5	849.0	339.9	1,938.6	1,253.7	562.6	2,589.8	119,930.2
1989:9	14.6	157.9	1,728.9	64.2	33.4	169.4	111.6	59.9	202.1	10,600.0
1989:10	16.7	157.6	1,876.0	55.4	33.9	140.2	114.1	54.8	309.3	10,517.2
1989:11	3.4	152.1	1,632.3	50.2	31.5	122.5	83.1	44.4	275.1	8,949.8
1989:12	1.9	138.9	1,685.7	52.3	20.6	140.1	64.7	35.8	242.3	7,262.4
1990:1	3.1	147.7	1,629.7	63.1	19.4	128.9	86.4	31.2	279.1	6,237.5
1990:2	2.2	145.0	1,425.3	46.6	27.9	91.6	95.5	31.5	272.1	7,240.3
1990:3	3.3	161.7	2,054.7	77.4	49.4	107.9	162.0	64.9	313.4	9,940.1
1990:4	8.3	172.6	1,800.7	77.0	42.1	135.6	137.5	55.5	300.2	9,721.8
1990:5	14.6	207.4	2,025.8	117.2	49.0	156.0	157.3	73.3	324.3	10,946.1
1990:6	28.5	177.1	2,132.4	76.9	51.4	162.4	168.2	80.4	312.0	10,433.0
1990:7	15.9	199.3	1,779.1	75.4	48.2	164.5	171.0	70.4	378.1	9,745.1
1990:8	16.6	232.9	1,765.6	66.7	53.1	170.1	207.2	109.9	366.8	9,941.4
1990:9	18.1	198.8	1,468.1	64.4	61.4	128.1	143.5	63.3	233.5	8,463.0

Data Note: Annual values are sums of monthly values.

NON-RESIDENTIAL CONSTRUCTION CONTRACTS: Western Region and United States

(Millions of Dollars)

Year / Month	ALASKA	ARIZONA	CALIFORNIA	HAWAII	IDAHO	NEVADA	OREGON	UTAH	WASHINGTON	UNITED STATES
1980	228.4	1,081.0	6,717.7	289.8	250.4	318.2	608.8	514.7	1,321.3	52,459.0
1981	385.4	980.2	7,194.1	291.6	177.6	413.2	587.0	451.0	1,323.4	59,402.0
1982	491.1	1,117.1	6,932.4	295.4	161.2	294.6	536.5	394.2	1,307.6	59,161.3
1983	718.8	1,065.3	8,195.2	178.1	144.7	322.4	376.2	452.5	1,218.1	64,804.2
1984	695.4	1,547.2	9,691.6	302.2	201.1	281.0	504.7	489.5	1,265.5	73,876.5
1985	594.7	1,891.1	10,440.3	278.2	261.0	430.4	602.0	506.2	1,760.2	82,596.0
1986	399.7	1,841.3	10,524.9	372.5	230.4	587.0	500.1	580.1	1,511.8	83,199.4
1987	263.2	1,933.5	11,574.6	417.2	208.1	619.4	636.4	435.0	1,990.4	92,720.4
1988	239.4	1,859.0	10,923.3	647.4	239.9	619.8	723.6	503.7	1,378.3	90,118.3
1989	149.4	1,677.2	12,093.0	793.8	192.3	820.3	658.7	423.2	1,413.6	95,785.9
1989:9	20.4	198.0	1,277.2	71.1	11.2	105.1	52.3	39.3	103.7	10,119.0
1989:10	20.1	97.5	1,042.4	70.7	19.5	92.4	47.4	38.8	136.8	8,532.9
1989:11	4.5	99.3	967.7	94.8	15.3	49.4	27.5	19.6	141.7	6,777.9
1989:12	0.7	98.8	943.8	60.0	15.3	61.4	29.3	22.3	95.7	6,167.0
1990:1	16.7	120.7	905.9	77.9	19.3	91.4	53.3	32.3	118.6	7,578.6
1990:2	7.8	99.8	727.6	24.4	17.4	140.6	73.1	59.2	108.5	4,821.0
1990:3	38.8	158.3	1,309.8	17.3	10.5	34.8	79.6	49.6	128.3	7,085.8
1990:4	15.8	92.6	779.6	63.9	21.4	102.5	43.2	24.8	78.0	6,380.8
1990:5	47.7	127.1	1,248.2	49.8	10.1	86.1	53.3	60.2	188.5	7,502.2
1990:6	20.7	156.5	1,307.8	56.1	28.3	136.7	76.8	34.3	166.9	7,902.4
1990:7	9.5	122.5	952.4	94.4	33.6	132.4	155.6	37.1	273.4	7,323.4
1990:8	21.9	126.8	1,160.6	98.8	43.1	64.2	95.5	76.2	220.7	7,173.7
1990:9	15.3	146.6	905.1	83.8	25.4	95.9	35.0	50.2	104.2	7,173.0
1990:10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Data Note: Annual values are sums of monthly values.

NON-BUILDING CONSTRUCTION CONTRACTS: Western Region and United States

(Millions of Dollars)

Year / Month	ALASKA	ARIZONA	CALIFORNIA	HAWAII	IDAHO	NEVADA	OREGON	UTAH	WASHINGTON	UNITED STATES
1980	232.7	497.4	2,263.6	125.2	111.8	147.1	367.2	138.6	1,826.3	32,696.0
1981	441.0	482.7	2,379.1	144.1	141.3	123.5	360.8	131.5	677.9	32,458.0
1982	428.9	1,077.5	2,322.5	192.5	138.6	196.3	342.0	2,367.0	970.1	37,143.2
1983	375.3	1,235.3	2,676.0	146.4	121.5	198.1	397.2	2,532.4	734.3	37,702.2
1984	445.1	689.6	2,529.3	171.1	133.1	211.6	555.2	325.5	738.8	35,829.0
1985	458.5	891.2	3,742.5	130.7	162.0	249.3	292.7	342.8	783.5	40,423.9
1986	399.0	757.0	3,998.5	222.7	156.4	225.8	310.5	241.3	942.2	41,249.8
1987	363.0	832.6	4,145.9	179.2	179.8	245.7	421.1	367.1	931.4	45,798.7
1988	414.7	766.5	4,503.3	360.9	334.8	225.9	407.2	380.1	983.3	47,168.2
1989	322.7	1,083.9	4,544.3	312.8	205.5	300.2	427.0	323.0	953.6	48,425.0
1989:9	37.2	105.2	375.8	19.4	22.9	10.7	33.8	35.1	105.1	4,548.0
1989:10	4.8	140.1	311.2	23.3	15.5	55.6	41.1	18.3	45.5	3,618.6
1989:11	12.8	103.1	546.6	31.4	39.1	3.8	20.3	30.0	156.0	3,409.3
1989:12	10.0	59.9	233.4	20.3	21.0	12.4	20.8	2.6	30.7	3,199.9
1990:1	14.3	182.9	262.1	43.3	1.4	20.2	25.7	25.0	73.4	2,654.7
1990:2	23.0	28.8	272.6	23.7	14.0	7.8	25.4	14.9	45.9	2,801.2
1990:3	11.4	63.3	345.5	26.6	11.9	19.0	32.1	22.0	115.9	3,893.7
1990:4	10.6	126.2	496.2	13.4	9.3	32.4	61.4	11.3	109.2	4,057.6
1990:5	8.8	88.6	652.4	17.7	5.7	22.6	206.5	40.5	118.7	5,128.1
1990:6	21.6	99.8	491.0	21.2	26.3	35.7	103.0	44.4	70.5	4,691.8
1990:7	23.3	79.9	470.0	176.1	11.6	12.0	53.4	36.6	82.7	3,824.9
1990:8	23.7	32.1	387.5	50.1	22.5	73.8	26.6	14.2	112.9	4,424.0
1990:9	15.0	59.6	399.7	13.5	12.6	9.6	27.5	30.4	52.1	3,612.0

Data Note: Annual values are sums of monthly values.

RESIDENTIAL BUILDING PERMITS: Western Region

(Number of Units)

Year / Month	ALASKA	ARIZONA	CALIFORNIA	HAWAII	IDAHO	NEVADA	OREGON	UTAH	WASHINGTON
1980	1,869.0	36,428.0	143,176.0	9,348.0	5,380.0	12,114.0	20,008.0	10,455.0	32,522.0
1981	3,040.0	35,948.0	113,248.0	7,252.0	3,514.0	11,218.0	14,125.0	7,410.0	26,416.0
1982	6,223.0	36,322.0	85,464.0	6,622.0	2,389.0	9,053.0	7,332.0	6,838.0	17,320.0
1983	12,063.0	63,902.0	171,455.0	5,735.0	4,247.0	16,359.0	8,873.0	13,511.0	27,891.0
1984	6,384.0	77,107.0	222,246.0	5,493.0	4,070.0	13,108.0	8,571.0	18,607.0	30,511.0
1985	4,154.0	71,668.0	266,130.0	6,412.0	4,190.0	13,128.0	11,019.0	14,672.0	34,293.0
1986	1,422.0	60,427.0	307,388.0	6,526.0	3,977.0	15,809.0	10,500.0	14,004.0	37,037.0
1987	798.0	39,635.0	243,087.0	6,261.0	3,235.0	15,877.0	11,750.0	7,760.0	37,142.0
1988	808.0	32,528.0	248,324.0	7,084.0	3,198.0	30,656.0	13,904.0	6,057.0	43,372.0
1989	648.0	23,315.0	235,877.0	9,693.0	4,763.0	29,143.0	22,374.0	6,134.0	45,596.0
1989:9	60.0	1,959.0	17,140.0	865.0	472.0	2,092.0	2,421.0	637.0	4,419.0
1989:10	79.0	1,857.0	21,022.0	909.0	388.0	1,799.0	1,781.0	575.0	4,467.0
1989:11	28.0	1,489.0	16,277.0	793.0	412.0	2,564.0	1,760.0	406.0	3,148.0
1989:12	15.0	1,438.0	21,109.0	285.0	331.0	2,368.0	1,579.0	291.0	3,600.0
1990:1	19.0	2,679.0	17,626.0	694.0	219.0	2,650.0	2,024.0	308.0	3,379.0
1990:2	22.0	1,664.0	14,907.0	533.0	269.0	1,973.0	1,014.0	397.0	3,813.0
1990:3	42.0	1,943.0	18,785.0	589.0	517.0	2,752.0	2,212.0	697.0	5,261.0
1990:4	81.0	2,028.0	15,901.0	877.0	557.0	2,373.0	1,997.0	664.0	3,713.0
1990:5	123.0	2,119.0	15,766.0	709.0	592.0	2,212.0	1,862.0	804.0	4,397.0
1990:6	85.0	2,136.0	17,583.0	709.0	475.0	2,389.0	2,921.0	747.0	4,749.0
1990:7	99.0	2,189.0	13,201.0	611.0	621.0	2,088.0	2,301.0	660.0	4,030.0
1990:8	93.0	2,187.0	12,635.0	410.0	525.0	3,111.0	2,454.0	788.0	4,540.0
1990:9	101.0	1,565.0	10,156.0	586.0	619.0	1,643.0	1,342.0	581.0	3,148.0
1990:10	NA	NA	NA	NA	NA	NA	NA	NA	NA

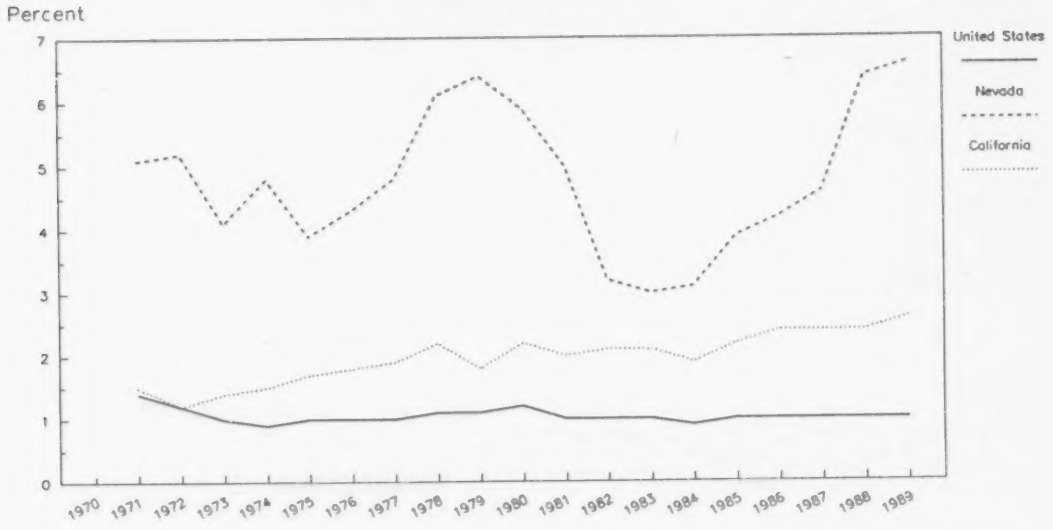
Data Note: Annual values are sums of monthly values.

STATE OF NEVADA
ECONOMIC INDICATORS

POPULATION

United States, Nevada and California

Percent Change from Previous Year



POPULATION AND COMPONENTS: Nevada

Year	POPULATION	BIRTHS (a)	DEATHS (b)	NATURAL INCREASE (a-b)	NET MIGRATION	BIRTH RATE (per 1,000)	DEATH RATE (per 1,000)
1980	810,502	13,626	6,859	6,767	38,435	16.8	8.5
1981	851,150	14,439	6,819	7,620	33,028	17.0	8.0
1982	878,260	14,935	7,278	7,657	19,453	17.0	8.3
1983	904,660	14,686	7,317	7,369	19,031	16.2	8.1
1984	933,010	15,263	7,644	7,619	20,731	16.4	8.2
1985	969,450	15,745	8,313	7,432	29,008	16.2	8.6
1986	1,010,280	16,277	8,421	7,856	32,974	16.1	8.3
1987	1,057,030	17,023	8,941	8,082	38,668	16.1	8.5
1988	1,124,590	18,415	9,464	8,951	58,609	16.4	8.4
1989	1,198,450	19,688	9,592	10,096	63,764	16.4	8.0

POPULATION COMPARISON

	UNITED STATES		NEVADA		CALIFORNIA		CLARK COUNTY		WASHOE COUNTY	
Year	Residents	% Change	Residents	% Change	Residents	% Change	Residents	% Change	Residents	% Change
1980	227,255,000	1.2	810,502	5.9	23,779,800	2.2	469,362	6.3	195,222	4.3
1981	229,637,000	1.0	851,150	5.0	24,267,000	2.0	494,460	5.3	201,620	3.3
1982	231,996,000	1.0	878,260	3.2	24,786,000	2.1	511,930	3.5	205,040	1.7
1983	234,284,000	1.0	904,660	3.0	25,309,000	2.1	531,210	3.8	210,860	2.8
1984	236,477,000	0.9	933,010	3.1	25,780,000	1.9	546,580	2.9	218,130	3.4
1985	238,736,000	1.0	969,450	3.9	26,358,000	2.2	572,140	4.7	224,340	2.8
1986	241,096,000	1.0	1,010,280	4.2	26,999,000	2.4	600,160	4.9	231,970	3.4
1987	243,427,000	1.0	1,057,030	4.6	27,655,000	2.4	631,920	5.3	238,010	2.6
1988	245,785,000	1.0	1,124,590	6.4	28,323,000	2.4	681,440	7.8	244,490	2.7
1989	248,239,000	1.0	1,198,450	6.6	29,063,000	2.6	733,180	7.6	251,130	2.7
1990	250,885,000	1.1			29,862,000	2.7				

LABOR FORCE COMPONENTS AND UNEMPLOYMENT RATE: Nevada

	CIVILIAN LABOR FORCE		EMPLOYMENT		UNEMPLOYMENT		UNEMPLOYMENT RATE		WAGES & SALARIES	
Year / Month		SA		SA		SA		SA	($ 000)	SA ($ 000)
1980	429,992		402,992		27,000		6.3		1,408,509	
1981	463,025		430,017		33,008		7.1		1,592,085	
1982	483,000		433,992		49,008		10.1		1,638,885	
1983	486,008		438,000		48,008		9.9		1,710,534	
1984	499,992		461,000		38,992		7.8		1,859,598	
1985	520,992		478,992		42,000		8.1		2,015,703	
1986	532,008		500,008		32,000		6.0		2,182,515	
1987	557,008		522,008		35,000		6.3		2,430,662	
1988	584,000		554,000		30,000		5.1		2,753,605	
1989	602,000		572,000		30,000		5.0		3,092,858	
1989:6	598,600	594,561	567,900	564,251	30,700	30,310	5.1	5.1	2,984,949*	3,011,818*
1989:7	602,600	598,791	572,100	567,676	30,500	31,115	5.1	5.2		
1989:8	599,900	599,587	571,800	569,588	28,100	29,999	4.7	5.0		
1989:9	602,000	600,518	572,100	568,013	29,900	32,504	5.0	5.4	3,122,706*	3,114,621*
1989:10	613,700	612,033	584,600	581,139	29,100	30,894	4.7	5.0		
1989:11	613,300	610,254	584,900	580,378	28,400	29,875	4.6	4.9		
1989:12	613,600	613,858	586,700	585,692	26,900	28,165	4.4	4.6	3,428,909*	3,326,901*
1990:1	608,400	618,716	577,700	590,039	30,700	28,677	5.0	4.6		
1990:2	614,700	620,558	584,400	592,975	30,300	27,583	4.9	4.4		
1990:3	618,700	621,331	588,200	593,748	30,500	27,583	4.9	4.4	3,243,500*	3,325,256*
1990:4	617,500	617,520	588,000	588,592	29,500	28,928	4.8	4.7		
1990:5	612,900	610,110	582,300	579,714	30,600	30,396	5.0	5.0		
1990:6	624,800	621,007	594,200	590,901	30,600	30,106	4.9	4.8		
1990:7	636,000	632,353	607,400	603,128	28,600	29,225	4.5	4.6		

* Figures available on a quarterly basis.

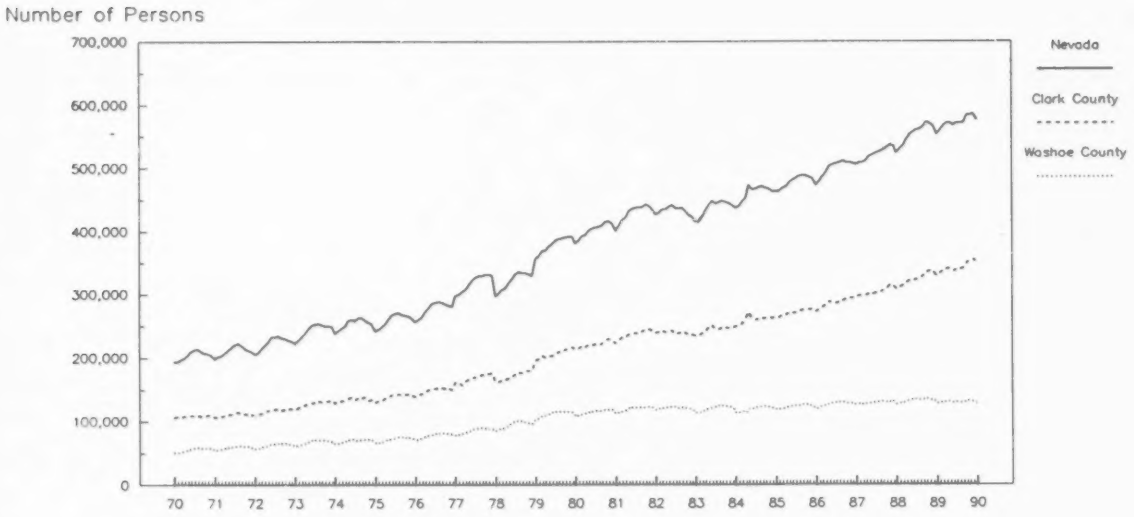
INDUSTRIAL EMPLOYMENT: Nevada

Year / Month	Mining	Manufacturing	Transportation	Public Utilities	TRADE		TOTAL
					Wholesale	Retail	
1980	8,007	6,217	19,158	12,883	11,175	13,167	67,142
1981	8,107	7,850	20,075	13,233	11,875	14,075	69,542
1982	8,207	6,617	18,767	12,950	11,967	13,708	66,175
1983	8,307	5,842	19,167	12,950	11,558	13,658	66,558
1984	8,407	6,575	21,042	13,525	11,392	14,742	71,150
1985	8,507	6,075	21,958	13,983	11,283	15,842	75,033
1986	8,607	6,308	22,258	15,150	11,392	16,708	78,025
1987	8,707	8,133	23,258	16,258	11,533	18,817	83,425
1988	8,807	11,050	24,908	17,067	11,975	20,417	89,342
1989	8,907	13,567	25,442	18,167	12,400	22,667	97,042
1989:6	8,906	14,000	25,600	18,100	12,500	22,900	96,900
1989:7	8,907	14,400	25,600	18,400	12,500	23,100	98,400
1989:8	8,908	14,300	25,800	18,700	12,000	23,000	99,200
1989:9	8,909	14,100	25,700	18,700	12,600	23,100	99,900
1989:10	8,910	14,200	25,600	18,600	12,800	23,300	100,200
1989:11	8,911	14,300	25,700	18,700	12,800	23,400	101,700
1989:12	8,912	14,400	25,700	18,900	12,700	23,300	103,300
1990:1	9,001	14,300	25,400	18,500	12,500	23,300	99,800
1990:2	9,002	14,400	25,700	18,600	12,500	23,300	99,700
1990:3	9,003	14,600	25,900	18,900	12,700	23,600	100,100
1990:4	9,004	14,800	26,000	19,000	13,000	23,900	101,100
1990:5	9,005	15,100	26,200	19,200	13,000	23,900	102,200
1990:6	9,006	15,500	26,300	19,300	13,000	24,400	103,500
1990:7	9,007	15,900	26,200	19,400	12,900	24,500	104,500

Year / Month	Construction	SERVICE				GOVERNMENT		
		F.I.R.E.	Hotels & Gaming	Other	TOTAL	Federal	State and Local	TOTAL
1980	80,308	26,192	17,933	114,958	54,200	169,158	10,358	46,642
1981	83,617	25,375	18,275	114,792	58,942	173,733	9,500	47,592
1982	79,883	19,950	17,942	114,525	60,300	174,825	9,717	48,492
1983	80,217	19,350	18,508	114,750	62,475	177,225	9,800	48,208
1984	85,892	21,808	19,950	120,058	66,792	186,850	9,983	48,950
1985	90,875	23,925	21,400	125,483	70,942	196,425	10,450	50,067
1986	94,733	27,733	22,383	128,925	77,658	206,583	10,883	50,667
1987	102,242	30,050	23,400	137,667	83,550	221,217	11,292	52,792
1988	109,758	36,292	24,483	145,283	89,783	235,067	11,383	55,575
1989	119,717	45,608	25,533	151,658	99,417	251,075	11,733	59,025
1989:6	119,800	46,500	25,700	154,000	100,000	254,000	11,900	57,700
1989:7	121,500	47,300	26,000	156,200	100,300	256,500	11,900	53,800
1989:8	122,200	49,100	26,000	156,200	103,100	259,300	12,000	54,300
1989:9	123,000	49,900	26,100	155,600	102,800	258,400	11,800	59,300
1989:10	123,500	50,300	26,000	155,000	102,000	257,000	11,800	62,000
1989:11	125,100	49,900	26,000	155,600	103,300	258,900	11,700	62,400
1989:12	126,600	49,100	25,900	156,100	102,600	258,700	11,700	62,600
1990:1	123,100	47,400	26,100	157,400	103,300	260,700	11,600	61,600
1990:2	123,000	47,100	26,300	157,500	103,100	260,600	11,600	63,100
1990:3	123,700	48,000	26,500	158,500	103,800	262,300	11,700	63,700
1990:4	125,000	48,900	26,600	159,800	104,500	264,300	11,700	63,500
1990:5	126,100	49,900	27,200	160,600	105,100	265,700	11,900	63,800
1990:6	127,900	51,200	27,400	164,000	105,500	269,500	12,100	61,800
1990:7	129,000	51,800	27,600	168,900	105,600	274,500	12,200	58,200

TOTAL CIVILIAN EMPLOYMENT

Nevada, Clark County and Washoe County



TAXABLE SALES, GAMING REVENUES, PERSONAL INCOME: Nevada

Year / Quarter	TAXABLE SALES ($ 000)	% Change	TAXABLE GAMING REVENUES ($000)	% Change	PERSONAL INCOME ($ millions)	% Change
1980	6,382.5	4.0	2,383.4	12.0	9,250.0	15.0
1981	6,741.7	5.6	2,532.2	6.2	10,458.8	13.1
1982	6,539.3	-3.0	2,627.5	3.8	10,956.5	4.8
1983	6,853.9	4.8	2,846.5	8.3	11,599.8	5.9
1984	7,624.7	11.2	3,075.1	8.0	12,678.8	9.3
1985	8,384.8	10.0	3,314.4	7.8	13,801.5	8.9
1986	9,163.5	9.3	3,482.1	5.1	14,931.8	8.2
1987	10,224.2	11.6	3,925.1	12.7	16,480.3	10.4
1988	11,768.4	15.1	4,270.1	8.8	18,821.8	14.2
1989	13,625.6	15.8	4,590.2	7.5	21,403.0	13.7
1989:1	3,137.5	20.6	1,098.1	6.1	20,052.0	3.9
1989:2	3,299.9	12.3	1,155.7	10.0	21,148.0	14.1
1989:3	3,422.9	11.9	1,214.6	7.2	21,643.0	12.8
1989:4	3,765.2	18.8	1,118.6	6.4	22,230.0	12.7
1990:1	3,384.3	7.9	1,274.4	15.7	22,866.0	11.0
1990:2	3,749.3	13.6	1,304.7	12.9	23,233.0	9.9

Data Note: Annual values for Taxable Sales and Taxable Gaming Revenues are sums of quarterly values.

AVERAGE WEEKLY HOURS: Nevada

Year / Month	Mining	Construction	Manufacturing	Durable Goods	Non-Durable Goods	Public Utilities	TRADE* Wholesale	TRADE* Retail	TOTAL
1980	39.8	35.1	38.2	39.3	35.9	40.7	NA	NA	33.8
1981	41.3	35.8	38.6	39.3	37.0	40.2	NA	NA	34.0
1982	41.1	34.8	37.4	37.8	36.7	39.8	NA	NA	34.0
1983	43.0	35.4	38.8	39.0	38.3	40.2	NA	NA	34.3
1984	42.9	35.9	39.8	40.1	39.2	40.7	NA	NA	34.0
1985	42.9	36.0	40.4	40.8	39.5	40.9	NA	NA	34.2
1986	42.9	37.1	40.2	41.1	38.4	40.4	NA	NA	33.8
1987	42.8	36.0	40.3	41.4	38.3	40.4	NA	NA	34.4
1988	44.0	36.8	39.9	40.8	37.8	40.6	NA	NA	34.6
1989	43.7	38.4	40.9	42.4	38.3	41.3	40.7	31.9	36.1
1989:5	42.6	37.9	41.9	43.5	39.1	40.9	40.8	31.7	36.3
1989:6	43.5	38.1	41.4	42.9	38.8	40.7	41.1	32.3	36.7
1989:7	44.7	39.6	40.3	41.6	38.1	40.8	40.6	33.3	37.0
1989:8	44.4	39.3	40.8	41.9	38.9	39.8	41.1	32.5	36.8
1989:9	44.1	39.5	40.7	41.6	39.1	40.8	41.0	31.9	36.5
1989:10	45.9	38.8	40.6	42.1	38.0	42.0	40.4	32.0	36.2
1989:11	44.1	39.2	41.2	43.0	38.1	43.6	40.6	31.5	36.1
1989:12	41.9	40.2	41.3	42.9	38.6	42.6	40.3	32.2	36.3
1990:1	43.4	36.9	41.1	42.8	38.1	43.0	40.2	31.5	35.9
1990:2	42.1	37.5	39.7	40.6	38.2	42.4	39.8	30.9	35.4
1990:3	42.9	38.5	40.8	42.3	38.2	42.5	40.4	31.1	35.8
1990:4	44.9	38.1	40.3	41.5	38.2	42.6	39.6	32.5	33.8
1990:5	44.1	38.6	39.8	42.5	34.9	43.2	40.6	31.5	33.2
1990:6	43.6	38.0	40.9	43.0	37.1	40.2	40.2	31.8	33.3

* Excluding Food & Drink

AVERAGE HOURLY EARNINGS: Nevada

Year / Month	Mining	Construction	Manufacturing	Durable Goods	Non-Durable Goods	Public Utilities	TRADE* Wholesale	TRADE* Retail	TOTAL
1980	9.29	14.06	7.70	7.96	7.29	8.55	NA	NA	6.74
1981	10.67	15.86	8.37	8.82	7.47	9.76	NA	NA	7.09
1982	11.52	16.93	8.80	9.26	7.89	10.78	NA	NA	7.56
1983	12.25	17.03	9.01	9.41	8.21	11.76	NA	NA	7.81
1984	12.87	16.87	9.11	9.52	8.36	12.39	NA	NA	8.12
1985	13.25	16.21	9.16	9.42	8.62	12.99	NA	NA	8.36
1986	14.01	16.17	9.35	9.61	8.82	13.74	NA	NA	8.50
1987	14.42	16.32	9.74	9.98	9.28	14.15	NA	NA	8.79
1988	14.56	16.19	10.11	10.27	9.71	14.62	NA	NA	9.10
1989	15.57	16.74	10.33	10.64	9.74	15.26	11.00	7.72	9.34
1989:5	15.42	16.43	10.23	10.54	9.66	15.35	10.85	7.47	9.16
1989:6	15.24	16.73	10.32	10.61	9.77	15.32	10.94	7.66	9.30
1989:7	15.71	17.30	10.35	10.73	9.63	15.39	11.08	7.69	9.39
1989:8	15.50	16.97	10.29	10.60	9.70	15.47	10.95	7.70	9.33
1989:9	15.57	17.09	10.35	10.67	9.78	15.33	11.13	7.85	9.49
1989:10	15.84	17.28	10.54	10.96	9.73	15.45	11.18	7.90	9.54
1989:11	15.56	16.99	10.54	10.95	9.75	15.30	11.02	7.98	9.50
1989:12	15.40	17.09	10.64	10.99	9.96	15.27	11.14	8.00	9.57
1990:1	15.77	16.62	11.09	11.19	10.90	15.66	11.03	8.03	9.53
1990:2	15.70	16.77	11.00	11.08	10.86	15.31	11.27	8.08	9.68
1990:3	15.86	17.15	10.90	10.97	10.77	15.21	11.14	8.42	9.78
1990:4	15.96	16.79	11.06	11.16	10.87	15.65	11.46	8.29	8.97
1990:5	15.95	16.75	10.87	10.94	10.70	16.02	11.23	8.33	8.97
1990:6	15.83	16.52	11.14	11.27	10.88	15.73	11.55	8.41	9.11

* Excluding Food & Drink

CONSTRUCTION - Residential Permits: NEVADA

Year / Month	UNITS TOTAL	UNITS Single Family	VALUATIONS TOTAL ($ 000)	VALUATIONS Single Family ($ 000)	VALUATIONS Non-Residential ($ Millions)
1980	11,752	6,275	457,871	320,138	511.4
1981	10,267	5,793	370,555	262,018	443.8
1982	8,138	4,364	293,128	210,192	257.9
1983	15,982	8,426	572,296	396,795	456.9
1984	13,749	6,698	89,447	393,717	442.0
1985	14,004	7,385	593,602	414,092	496.4
1986	15,655	9,940	758,242	593,747	592.8
1987	16,345	10,178	785,850	611,136	540.5
1988	30,656	12,833	1,225,258	726,323	646.5
1989	29,143	16,129	1,559,177	1,130,491	960.6
1989:6	4,051	1,360	174,849	90,027	62.0
1989:7	2,104	1,345	121,825	98,118	50.6
1989:8	2,445	1,661	147,689	115,257	115.1
1989:9	2,092	1,319	119,916	98,148	71.2
1989:10	1,799	1,205	105,803	90,818	47.8
1989:11	2,564	1,604	176,746	131,498	87.4
1989:12	2,368	1,389	152,037	120,197	53.8
1990:1	2,650	1,061	171,880	96,019	78.4
1990:2	1,973	1,135	109,609	82,115	82.6
1990:3	2,752	1,311	186,048	121,632	53.0
1990:4	2,373	1,379	196,696	148,512	N/A
1990:5	2,212	1,593	186,683	157,591	75.0
1990:6	2,389	1,262	133,365	97,436	N/A
1990:7	2,088	1,265	124,516	98,992	N/A

Data Note: Annual values are sums of monthly values.

HIGHWAY TRAFFIC COUNT - (Both directions of travel)

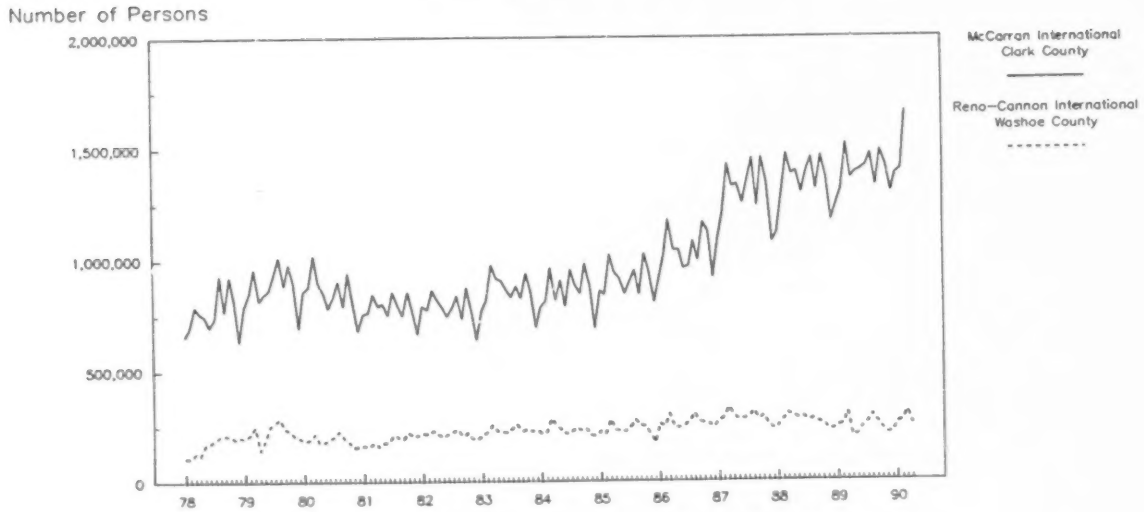
Year / Month	VEHICLES PER DAY I-15 at Jean CA Border	I-15 at Apex East of Las Vegas	US 50 South Tahoe CA Border	I-80 at Wells East of Elko	US 95 at Contact Idaho Border	US 95 at Orovada OR Border	I-80 at Verdi West of Reno	US 395 at Bordertown North of Reno	US 6/50/90 at Ely Utah Border
1980	4,883,359	2,532,281	11,256,603	1,077,094	445,097	395,293	5,827,480	2,040,682	321,726
1981	5,166,067	2,846,804	11,339,881	1,180,627	487,838	408,276	6,033,960	2,121,405	319,289
1082	5,238,269	2,958,128	10,869,896	1,095,956	445,294	381,522	5,820,926	2,022,780	281,689
1983	5,452,274	2,900,552	10,811,948	1,093,691	469,513	388,955	6,148,445	2,156,360	258,850
1984	5,727,717	2,981,679	11,631,646	1,168,169	489,210	400,497	6,498,795	2,291,324	284,632
1985	6,002,289	3,188,708	11,913,738	1,231,782	476,321	388,196	6,799,758	2,402,631	272,967
1986	6,215,637	3,241,187	12,147,053	1,285,330	494,739	399,074	6,979,696	2,424,476	265,347
1987	6,598,336	3,593,780	12,463,463	1,407,453	531,335	435,601	7,438,645	2,557,512	291,228
1988	7,130,132	3,850,896	12,637,785	1,578,468	583,121	474,262	7,856,844	2,617,250	311,181
1989	7,921,381	4,190,977	12,807,332	1,653,364	612,362	473,764	7,716,028	2,661,320	334,217
1989:8	770,397	429,433	1,353,272	205,492	67,784	49,633	830,605	286,475	40,775
1989:9	690,416	359,328	1,146,251	168,205	56,648	44,036	733,676	262,213	34,506
1989:10	631,510	340,613	997,325	145,738	53,574	43,639	618,723	234,664	32,686
1989:11	659,682	328,872	896,243	116,412	46,543	39,790	588,955	201,189	24,652
1989:12	700,063	333,576	1,020,721	103,840	42,923	34,724	599,069	201,486	19,868
1990:1	596,724	287,568	959,129	93,726	36,774	28,722	506,607	153,470	17,703
1990:2	557,625	281,081	889,368	84,504	35,220	27,579	449,594	143,180	16,066
1990:3	672,279	354,532	1,053,012	108,506	48,741	38,412	587,256	180,633	23,209
1990:4	737,893	367,906	978,984	125,807	49,835	40,076	643,959	216,057	28,051
1990:5	758,671	372,984	1,074,747	146,566	51,884	43,799	687,720	243,210	33,150
1990:6	797,510	417,191	1,171,351	180,597	63,859	48,770	778,259	267,567	38,067
1990:7	854,731	439,840	1,361,580	192,735	71,449	50.377	838,364	289,474	40,307
1990:8	891,492	476,249	1,375,396	201,132	70,949	51,911	865,196	295,262	40,766
1990:9	745,084	381,181	1,146,365	158,139	53,925	45,153	755,508	257,668	34,034

Data Note: Annual values are sums of monthly values.

AIRPORT PASSENGER COUNT

Enplaned and Deplaned Passengers

Passengers per Month



AIRPORT PASSENGER COUNT
(Total Enplaned and Deplaned Passengers)

Year / Month	McCarran International	% Change	Reno-Cannon International	% Change
1980	10,302,106	NA	2,502,098	NA
1981	9,469,817	(8.1)	2,500,592	(0.1)
1982	9,438,646	(0.3)	2,594,929	3.8
1983	10,311,907	9.3	2,793,225	7.6
1984	10,142,744	(1.6)	2,823,358	1.1
1985	10,924,047	7.7	2,829,024	0.2
1986	12,428,748	13.8	3,170,619	12.1
1987	15,582,302	25.4	3,420,075	7.9
1988	16,231,199	4.2	3,257,374	(4.8)
1989	16,683,634	2.8	3,088,004	(5.2)
1989:8	1,472,182	1.0	297,670	6.2
1989:9	1,329,592	0.9	267,688	0.1
1989:10	1,489,024	1.7	267,647	2.3
1989:11	1,426,608	4.6	244,696	4.2
1989:12	1,304,529	10.9	238,852	2.9
1990:1	1,383,442	10.8	261,565	5.7
1990:2	1,403,369	7.0	271,226	6.2
1990:3	1,663,363	9.4	314,523	2.4
1990:4	1,561,080	14.3	254,823	12.2
1990:5	1,529,485	9.9	242,834	6.7
1990:6	1,549,293	10.5	237,143	(2.3)
1990:7	1,588,077	11.8	248,197	(6.0)
1990:8	1,754,995	19.2	265,358	(10.9)
1990:9	1,538,554	15.7	243,362	(9.1)

Data Note: Annual values are sums of monthly values.

Data Sources

The data sources are numerous. The majority of Nevada data was obtained in cooperation with the following: Airport Authority of Washoe County; Carson City Department of Public Works; Churchill County; City of Elko; City of Las Vegas, Nevada Building and Safety; City of North Las Vegas; City of Reno, Building and Safety Department; City of Sparks; Clark County Department of Aviation; Las Vegas Convention/Visitors Authority; Nevada Power Company; Reno-Sparks Convention/Visitors Authority; State of Nevada Department of Taxation; State of Nevada Department of Transportation; State of Nevada Employment Security Department; State of Nevada Gaming Control Board; State of Nevada Health Division; State of Nevada Office of the Demographer; U.S. Bureau of the Census; U.S. Department of Commerce; U.S. Bureau of Labor Statistics; Washoe County Building and Safety Division; and White Pine County Regional Planning Commission.

National data were obtained from computer files provided by Citicorp Database Services. The western regional data were provided by the Research Department of the Federal Reserve Bank of San Francisco.

The majority of data within the Economic Indicators section of this issue is self-explanatory; however, there are three considerations to bear in mind. First, monthly and quarterly percentage changes are calculated using the corresponding month or quarter in the previous year unless otherwise noted. Second, data that was either obtained in a seasonally adjusted form or that was seasonally adjusted by the Bureau of Business and Economic Research is labeled "SA." All other data should be regarded as unadjusted for seasonal variation. Third, annual values are averages of the montly or quarterly values unless otherwise noted.

The Bureau of Business and Economic Research and the *Review* staff express appreciation for the efforts of numerous individuals representing these data sources without which this publication would not have been possible. Specifically, the *Review* would like to extend special thanks to Carolyn Sherwood-Call and Randall Pozdena of the Federal Reserve Bank of San Francisco. They were particularly helpful in providing data for the western region. In addition, the assistance of Steve Dean, a research associate at the Federal Reserve Bank of San Francisco is acknowledged.

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PREFACE

The Spring/Summer 1991 issue of the *Nevada Review of Business & Economics* consists of two parts. The first includes five refereed articles, each of which tocuses on a topic of interest to Nevada.

The article by Lawrence Dandurand, J. Kent Pinney and William Thompson presents a comprehensive and understandable framework to be used in the analysis of gaming business units.

The article by Herbert E. Gishlick and Charles W. McCall critically analyzes the competitive effects of the 1984 proposed Southern Pacific/Santa Fe Railroad merger and reviews the ICC reasoning in disallowing the merger.

The paper by Bobby E. Apostolakis examines local industrial subsidization, an economic approach widely utilized by local authorities and development organizations throughout the United States as an incentive to industrial development and the "panacea" for fiscal ills and regional unemployment. The state of Arkansas provides the focus for the author's empirical application.

The article on transit analysis by Jeffrey Waddoups reviews of a number of issues that may arise within the process of determining the fiscal soundness and viability of an existing transit system or the potential impacts of a future transit system. The paper also suggests new directions for decision-makers in their analyses of current and potential transit projects.

The fifth article updates AIDS-related past and future income losses and economic impacts within the state of Nevada. Authors Clarence G. Ray and Vicky Carwein present fiscal issues to be confronted by the state as it deals with AIDS.

The second part of the *Review* consists of detailed economic indicators that focus on the state of Nevada, its major metropolitan areas, and its counties.

The inside back cover of the *Review* presents information on the data sources and considerations that need to be taken into account in reviewing the Economic Indicator tables and graphs.

A Global Framework for Analyzing Gaming Business Units

*by Lawrence Dandurand, J. Kent Pinney, and William Thompson**

Introduction

The nature of legalized gaming in the United States is undergoing profound change. This change is being caused by fundamental alterations in the social, political, economic, and technological environments affecting gaming activities. As examples: (1) gaming is becoming more socially acceptable; (2) governmental units are approving new gaming activities; (3) more households are spending discretionary income on gaming; and (4) new technological developments (such as computer chips) are being integrated into gaming products (*Business Week*, 1989, pp. 112-115, 118; Dillin, 1989, p. 7; and Siewers, 1988, p. 1, 36).

Legalized gaming is being affected by numerous developments that occurred during the 1980's. These developments included: expansion of existing casino gaming facilities; casino gaming in new geographical areas; increased competition among existing and newly emerging gaming institutions; new and sophisticated marketing programs; state lotteries; card rooms; cruise ship gaming; floating river casinos; pari-mutuals; progressive slots; Indian reservation gaming; multi-casino computer linked gaming systems; patron slot clubs; sports book facilities; video gaming; high-tech slot machines; gaming investments in the financial markets; and management by public corporations.

The current magnitude of global gaming behavior is impressive. In the United States alone, thirty-two states and the District of Columbia now have lotteries. The American per capita lottery wager is $90 per year. Sixty-eight percent of the population of the United States now live in states that support lotteries, and it is estimated that the present annual wager in the country is $200 billion (Will, 1989, p. 78).

In the global context (ranging from Afghanistan to Zimbabwe), 140 countries, territories, possessions, and protectorates now have legal gaming. Of these, 108 jurisdictions have general lotteries, 78 have casino gaming, 74 have horse racing, and 63 have slot machines (Davis and La Fleur, 1988, pp. 24, 25, 27).

The trend in the number of persons participating in gaming activities is upward. In Las Vegas alone, the visitor volume exceeded 18 million persons (person trips) in 1989. This gaming trend is occurring in conjunction with complementary sociodemographic, economic, and competitive trends. These trends include an increase in affluence; an improvement in communications and transportation infrastructures; an increase in early retirement; a more active life style for senior citizens; increased immigrations (especially from Latin America and Southeast Asia); significant population migrations (such as shifts to the "sunbelt" states); changing population structures (such as ethnic group proportions); an increase in non-family households; an increase in the number of working women; an increase in two pay-check households; an increase in short vacations; an increasing exposure to new ideas (via advertising, education, movies, video cassette recorders, and cable television); an increasing desire for convenience; an increase in expectations; an increasing search for stimulation; an increasing demand for instant gratification; and the declining influence of family, religion, and other social institutions.

All of these environmental changes impact upon government and corporate decision makers. They indicate a need for timely and improved understanding, reporting, and planning with respect to gaming phenomena. For example, governments need to predict the impact of gaming behavior on revenues and welfare, and they need to develop appropriate laws and regulations. Likewise, corporations need to forecast market potentials and to develop viable business programs. Similarly, financial markets need to determine the quality of gaming investments in order to allocate funds efficiently. In addition, academicians, writers, and reporters need to know what types of questions to ask and how to communicate their findings.

Previous research has not provided a clear, concise, and practical means to meet the analysis needs of different officials working in or regulating the gambling industry. It is the purpose of this paper to present a general business analysis tool that can be used by government, corporate, financial, and media analysts to improve their understanding and articulation of gambling phenomena. In particular, the objective is to present a comprehensive, succinct, and comprehensible framework that can be used by a variety of persons for a variety of reasons in a variety of situations, over time, in order to monitor, describe, and analyze dynamic gambling phenomena across organizations, markets, and countries.

Components of the Analytical Framework

The analytical framework is a business tool that indicates the major factors and factor interrelationships involved in

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managing an organization. Its application and components are related to the processes and tools used in business auditing and business planning. Business auditing is a review of the business systems, strategies, and performance of an organization. Its purpose is to identify organizational strengths and weaknesses. The orientation of business auditing is directed toward variances and inconsistencies. Business planning is the process of generating and selecting viable business strategies for an organization. Its purpose is to produce a business plan. The orientation of business planning is on the future (both short and long term). A business audit can be a viewed as an integral part of the business planning process.

Many of the questions used in a business audit could be used along with the analytical framework presented in this paper. Likewise, many of the variables cited in typical business planning guidelines are complementary to those indicated in the analytical framework (e.g., David, 1989; Burton and McBride, 1988; *Small Business Success*, 1988; Leza and Placencia, 1987; and Luther, 1987).

In this paper, groups of business factors are clustered together as components of the analytical framework. The approach to organizing the contents of the component structures is derived from the detailed marketing plan structure approach developed by Dandurand and Kennedy (1989). Specific components and component descriptions, as well as factors and factor descriptions, are derived by the authors after reviewing Dandurand and Kennedy, David, Burton and McBride, *Small Business Success*, Leza and Placencia, Luther, and a business plan outline used by the Small Business Center at the local university. Figure 1 (see p. 4) shows the components of the analytical framework and provides a description for each component.

Interrelationships of Components

The components of the analytical framework are interrelated. In addition, the set of components, itself, can be linked to environmental, market, and management factors.

Figure 2 (see p. 5) depicts the internal and external environmental factors that influence all of the components of the analytical framework. The internal factors are the logical starting points for an examination of gaming phenomena. It is here, for example, that past experience and basic missions and objectives are reviewed. This review helps to indicate which external environment events are relevant to subsequent analysis.

It should be noted that a specific internal environmental factor (such as resources) listed in Figure 2 represents a number of internal environmental variables (such as capital and raw materials resources). Furthermore, especially in a global context, an external environmental factor (such as economic) contains a number of variables (such as geography and climate) that are important in analyzing gaming phenomena.

Figure 2 shows the interrelationships and linkages. Figure 2 indicates the environmental factors, the functional relationships of the set of components of the analytical framework, the market and management factors, and the relationships of the set of components of the analytical framework to the environmental, market, and management factors. For example, the personnel policy is a function of the operations policy, the marketing policy, the strategic business policy, and the strategic situation analysis. The strategic situation analysis reflects relevant strategic events in the external and internal environments. The personnel policy is a determinant of the financial policy and interacts with different labor markets. Management, through its basic functions of planning, execution, and control, causes the underlying system to work. In all cases, the term "policy" can be interchanged with the words "practice," "plan," "behavior," "situation," or "experience."

The Structures of the Components

Each component (e.g., the marketing policy) of the analytical framework has a structure composed of factors (such as the sales programs factor) relevant to that component. Each factor, in turn, contains a set of variables that constitutes the factor. For example, the sales programs factor (as developed by Dandurand and Kennedy and modified in this paper) contains the following variables: (1) sales programs objectives; (2) sales programs strategies; (3) sales programs action statements; (4) sales appeals; (5) deployment schedules; and (6) sales programs budgets.

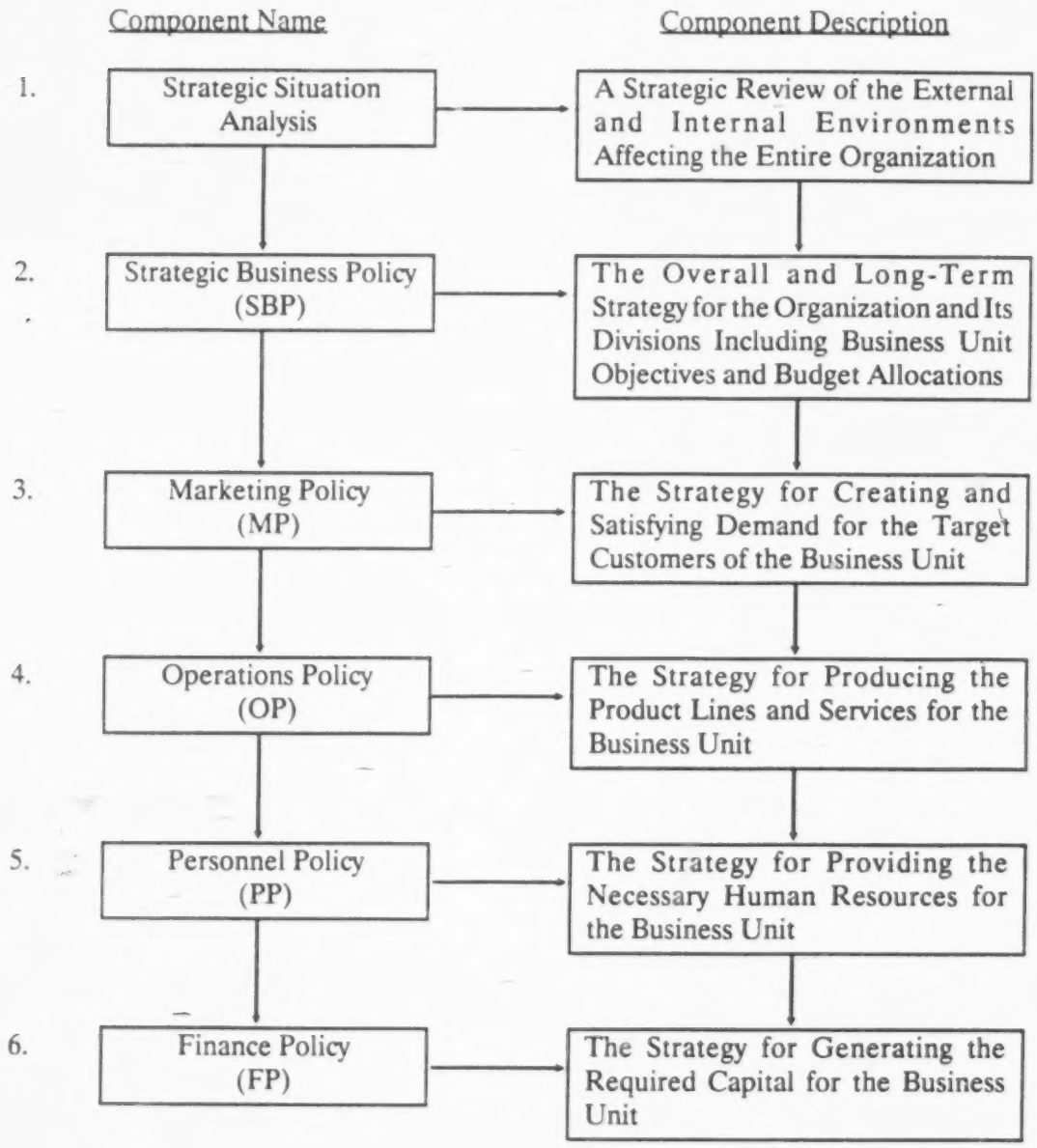
It should be noted that each factor in the analytical framework (other than the strategic situation analysis and the strategic business policy components) contains a universal set of variables (objectives, strategies, action statements, schedules, and budgets) as well as specific variables relevant to that factor (such as the sales appeals for the sales programs factor). A complete list of all the variables associated with all of the factors is beyond the scope of the present project. The reader can consult various textbooks, planning guides, and auditing guides regarding each component of the framework in order to generate lists of relevant variables. This paper concentrates on the factors that are relevant to each component of the analytical framework.

It is assumed that most of the terms (such as reviews, recaps, summaries, analyses, implications, and statements) used in the analytical framework are familiar, understood, self-explanatory, or could be easily determined. The term "objectives" is used to refer to ends sought. An example of an objective is "to achieve a return on investment of at least 20 percent." The word "strategies" relates to how objectives are achieved. An example of a strategy is "to emphasize progressive slot play." Tables 1 through 6 (see pp. 8 and 9) illustrate the structures of the components of the analytical framework.

General Application of the Analytical Framework

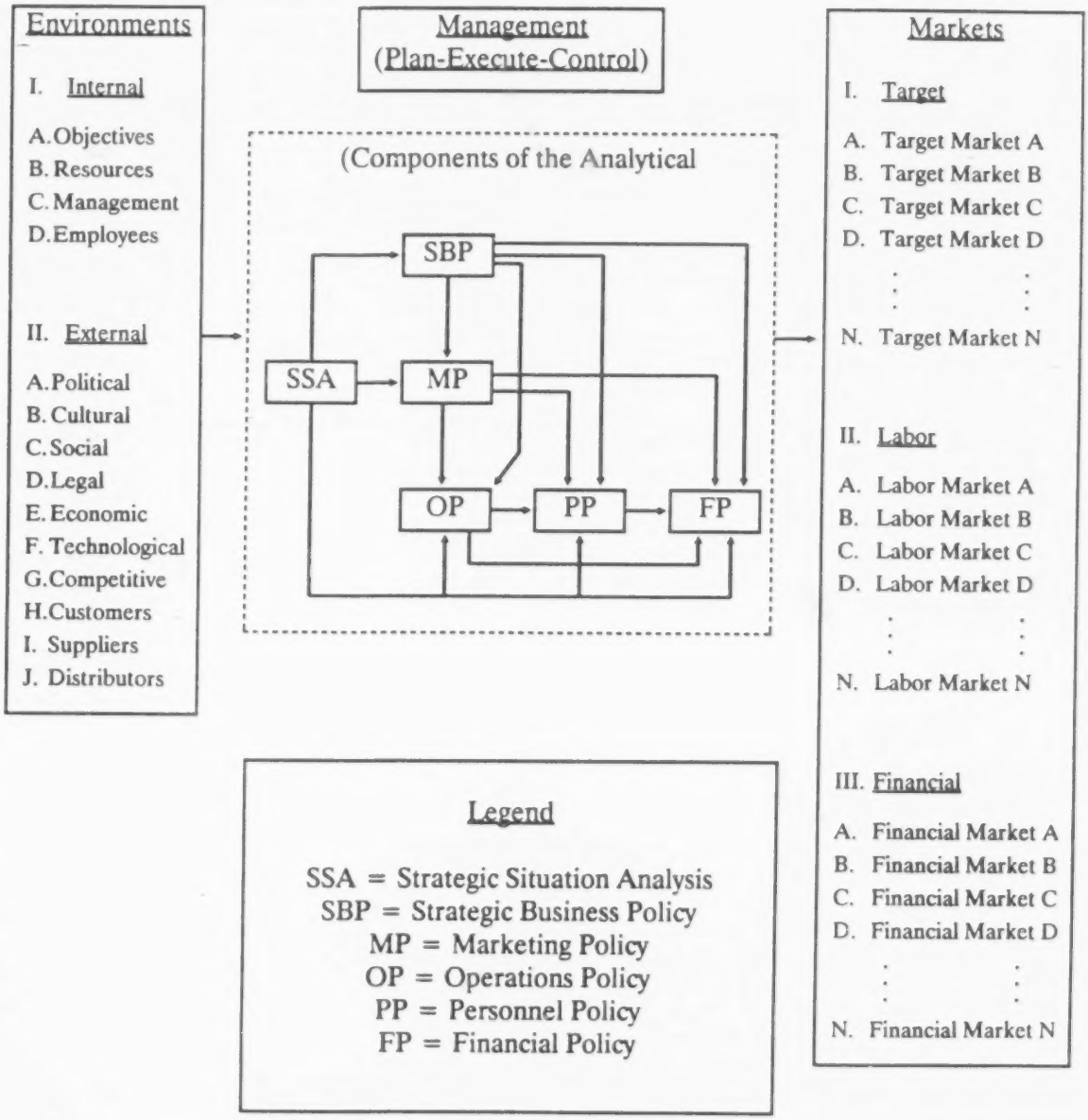
The six components of the analytical framework can be applied to any business organization (or gambling jurisdiction) or group of business organizations. In other words, the questions inherent in the nature of the framework can be posed to any relevant authorities regarding any casino (or any type of gaming activity unit, such as a lottery) or groups of casinos. This concept can be extended to a global context where all of the

FIGURE 1
Components of the Analytical Framework


Component Name
Component Description
1.
Strategic Situation Analysis
A Strategic Review of the External and Internal Environments Affecting the Entire Organization
2.
Strategic Business Policy (SBP)
The Overall and Long-Term Strategy for the Organization and Its Divisions Including Business Unit Objectives and Budget Allocations
3.
Marketing Policy (MP)
The Strategy for Creating and Satisfying Demand for the Target Customers of the Business Unit
4.
Operations Policy (OP)
The Strategy for Producing the Product Lines and Services for the Business Unit
5.
Personnel Policy (PP)
The Strategy for Providing the Necessary Human Resources for the Business Unit
6.
Finance Policy (FP)
The Strategy for Generating the Required Capital for the Business Unit

Note: Marketing, operations, personnel, and finance policies are different for each business unit.

FIGURE 2
Functional Relationships of Components of the Analytical Framenwork

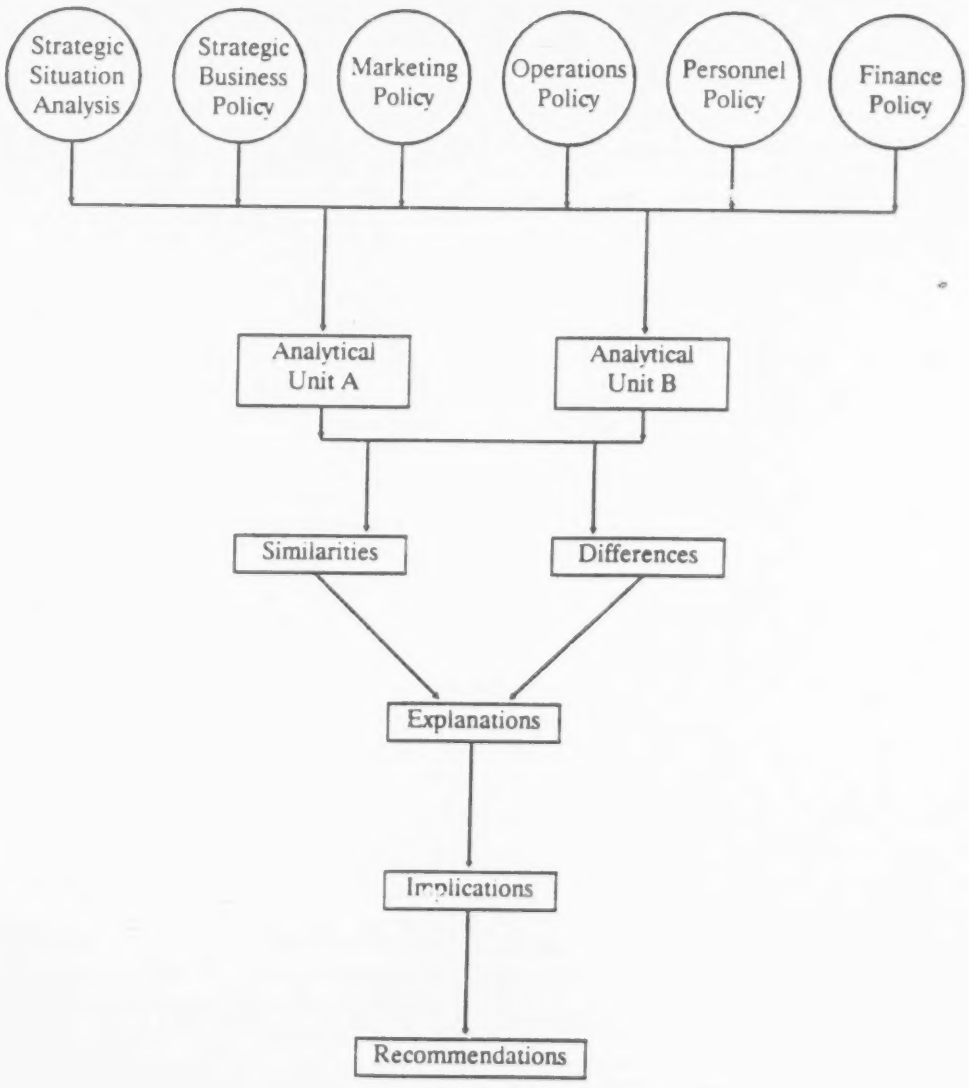


Note: The direction of the arrow indicate the direction of the influence.

gaming activities in a country (or any given number of countries) can be examined as a unit. Once described, these global units can be compared across countries (or groups of countries, such as economic unions).

At any level or type of analysis, the framework can be used to describe one or more units of analysis. A complete description of an analytical unit would consist of a statement (answer) to each factor (or variable) contained in the analytical framework. When the framework is applied to more than one unit, (e.g., two countries) the analyst can use the descriptions (paralleling the analytical framework) to generate similarities (e.g., in religious backgrounds) and differences (e.g., in gaming regulatory agencies). The analyst can then focus on explaining similarities and differences (e.g., how Christian-Judeo and Islamic values affect gaming attitudes) between or among the analytical units. In certain situations (such as in corporate marketing planning), the analyst can proceed to deduce implications (e.g., capital needs) of the findings and, if appropriate, to make recommendations (e.g., to legalize casino gaming). Figure 3 illustrates the application of the analytical framework

FIGURE 3
Application of the Analytical Framework



using hypothetical analytical units A and B.

Specific Global Applications of the Framework

Moving from the general to the specific case, sample applications of the framework are provided by comparing gaming institutions in the Netherlands of the European Economic Community and those in Las Vegas, Nevada, in the United States. The framework of this paper provides for a detail of analysis that is not necessary to demonstrate here. Instead, in the following example, the authors provide a sample of the factors listed under the six tables contained within the paper.

The comparison is of two politically-defined jurisdictions that have established casino authorities. The approach utilizes a combination of historical and contemporary examples. Comparisons could also be made of separate communities of casinos such as Las Vegas, Nevada, and Atlantic City, New Jersey, at the national level; Laughlin and Reno at the Nevada state level; or alternatively, between individual properties such as Caesars Palace and the Mirage on the Las Vegas strip.

The Strategic Situation Analysis Structure

Historical Introduction

The Netherlands legalized the creation of federally-owned casinos to ward off the negative effects of illegal gaming in the country during the 1970's. Secondarily, the federal government of the Netherlands desired to recapture the patronage of Dutch gamers who were venturing off to the United Kingdom, West Germany, France, and elsewhere in order to engage in alternative forms of gaming. Finally, it was also hoped that foreign nationals might be attracted to the Netherlands to gamble, thereby contributing to a positive flow to the Dutch balances of trade and payments (Polders, p. 31-33; Thompson, p. 34-42; and Thompson and Pinney, 1990).

The State of Nevada legalized privately-owned gaming casinos in 1931 not only as a revenue-generating mechanism for all levels of government -- state, county, and city -- but also as a recognition that many quasi-legal and illegal operations were already openly offering gaming products and services to the general public. (Dombrink and Thompson, 1990; and Edington, 5-11).

Political Environment

The political environment of the two entities were in stark contrast to each other. In the Netherlands, strong division existed among the various religious and other interest groups. Protestant and socialist opposition to casino gaming was emotional and public. The approving legislation only occurred in the presence of an extremely mixed parliament, on a vote divided almost evenly between the two major factions.

In contrast, the State of Nevada enjoyed near-unanimous political support for the casino industry within the state. Organized religious positions played no vital role in the process. To this day, the industry is a dominant voice in state political decision making.

Strategic Business Strategies

One of the basic business strategies in the Netherlands originally was to locate the casinos in resort communities. Only later -- as a necessary adjustment to the coutinuing presence of illegal casinos -- were the legal casinos moved to major urban centers.

In Nevada, there were no policy directives regarding locations except for rules of zoning within local communities. Casinos were -- and continue to be -- located in a multitude of places. Most of them lie within the two major metropolitan areas of Las Vegas and Reno. Others are located at Lake Tahoe and Laughlin in the north and south, respectively. Additional casinos are found in rural locations near state borders and in small towns and villages.

Strategic Market Appraisal

The market potential for the gaming industry in the Netherlands is primarily a function of the economic growth and success of the Netherlands as a part of the larger European community. The market potential for the gaming industry in Nevada is a function of the economic growth and success of the southwestern quadrant of the United States in particular and the overall economy in general. It should also be noted that the economic growth and success of the State of Nevada is a direct function of the growth and success of the gaming industry within the State of Nevada.

Strategic Markets

Dutch casinos had their greatest appeal to the fairly homogeneous high class affluent, both within and without the Netherlands. Restrictions were administered to any appeals made to the working blue collar classes. In large part, this policy was instituted to win the acquisition of passive support from religious and socialist opponents of the casinos. There was a strong desire to keep resort-oriented Dutchmen from leaving the country to gamble, but also to attract similar types from contiguous countries of the European Community.

In Nevada, markets have been extremely heterogeneous, ranging from those which regarded the casinos and their respective communities as resort destinations, including both "high and low rollers," to intercepting transcontinental travellers moving primarily from coast to coast (but almost any traveller moving from anywhere to anywhere within or through the state), to entertaining locals in remote mining, timber, and agricultural communities both within the state as well as in nearby communities in contiguous states.

Strategic Product Lines

Until 1987, Dutch casinos were limited to table games, in particular baccarat and French roulette. American roulette, blackjack, and slots were introduced several years after the casino first opened. Noticeably absent were poker and craps. "Amenities" have not been a major part of the product mix in the Dutch casino. Rarely will a Dutch casino gamer have access

Table 1
Strategic Situation Analysis Structure

Strategic Situation Factor	Factor Description
1. Executive Summary	Succinct recaps of relevant strategic facts
2. Historical Introduction	Brief reviews of past strategic facts
3. Historical Analyses	Recaps of historical strategic facts
4. The Organization's Objectives	Statements of relevant organization objectives
5. The Organization's Resources	Statements of relevant organization resources
6. The Organization's Management	Statements of relevant management facts
7. The Organization's Employees	Statements of relevant employee facts
8. Political Environment	Statements of relevant political facts
9. Cultural Environment	Statements of relevant cultural facts
10. Social Environment	Statements of relevant social facts
11. Legal Environment	Statements of relevant legal facts
12. Economic Environment	Statements of relevant economic facts
13. Technological Environment	Statements of relevant technological facts
14. Competitive Environment	Statements of relevant competitive facts
15. Customers Environment	Statements of relevant customer facts
16. Suppliers Environment	Statements of relevant supplier facts
17. Distributors Environment	Statements of relevant distributors facts

Table 2
Strategic Business Policy Structure

Strategic Business Factor	Factor Description
1. Strategic Executive Summary	Succinct recaps of strategic strategies
2. Strategic Historical Introduction	Brief reviews of past strategic strategies
3. Strategic Historical Analyses	Recaps of historical strategic strategies
4. Strategic Situation Analysis	Summaries of relevant strategic facts
5. Strategic Business Mission	Basic Purposes of the Organization
6. Strategic Business Objectives	Basic Objectives of the Organization
7. Strategic Business Strategies	Basic Strategies of the Organization
8. Strategic Market Appraisal	Analyses of Opportunities for the Organization
9. Strategic Markets	The Types of Customers to Target
10. Strategic Product-Lines	The Types of Products to Produce
11. Strategic Budget Allocations	The Allocations of Funds to Product-Markets
12. Strategic Business Policy Budget	Financial Implications of the Organization's Strategies
13. Strategic Implementation Strategies	Strategies regarding strategic execution
14. Strategic Control Strategies	Strategies regarding execution review
15. Strategic Contingency Strategies	Strategies regarding alternative scenarios

Table 3
Marketing Policy Structure

Marketing Factor	Factor Description
1. Executive Summary	Succinct recaps of marketing strategies
2. Historical Introduction	Brief reviews of past marketing strategies
3. Strategic Policies	Summaries of relevant organization's strategies
4. Historical Analyses	Recaps of historical strategies and financial data
5. Situation Analyses	Reviews of external and internal environments
6. Market Appraisals	Analyses of opportunities and targets
7. Market Strategies	Overall strategies for target markets
8. Product Programs	Product strategies for target markets
9. Distribution Programs	Distribution strategies for target markets
10. Price Programs	Price strategies for target markets
11. Advertising Programs	Advertising strategies for target markets
12. Sales Programs	Sales strategies for target markets
13. Sales Promotion Programs	Sales promotion strategies for target markets
14. Publicity Programs	Publicity strategies for target markets
15. Marketing Policy Budget	Financial implications of programs
16. Implementation Strategies	Strategies regarding program execution
17. Control Strategies	Strategies regarding execution review
18. Contingency strategies	Strategies regarding alternative scenarios

Table 4
Operations Policy Structure

Operations Factor	Factor Description
1. Executive Summary	Succinct recaps of operations strategies
2. Historical Introduction	Brief reviews of past operations strategies
3. Strategic Policies	Summaries of relevant organization's strategies
4. Historical Analyses	Recaps of historical strategies and financial data
5. Situation Analyses	Reviews of external and internal environments
6. Location Programs	Strategies for locating facilities
7. Physical Facilities Programs	Strategies regarding physical facilities
8. Capital Equipment Programs	Strategies regarding capital equipment
9. Manufacturing Process Programs	Strategies regarding manufacturing processes
10. Quality Control Programs	Strategies regarding quality control
11. Research and Development Programs	Strategies regarding research and development
12. Purchasing Programs	Strategies regarding purchasing
13. Inventory Control Programs	Strategies regarding inventory control
14. Cost Control Programs	Strategies regarding cost control
15. Labor Programs	Strategies regarding labor
16. Operations Policy Budget	Financial implications of programs
17. Implementation Strategy	Strategies regarding program execution
18. Control Strategy	Strategies regarding execution review
19. Contingency Strategy	Strategies regarding alternative scenarios

Table 5
Personnel Policy Structure

Personnel Factor	Factor Description
1. Executive Summary	Succinct recaps of personnel strategies
2. Historical Introduction	Brief reviews of past personnel strategies
3. Strategic Policies	Summaries of relevant organization's strategies
4. Historical Analyses	Recaps of historical strategies and financial data
5. Situation Analyses	Reviews of external and internal environments
6. Organizational Design Programs	Strategies regarding organizational design
7. Organization Climate Programs	Strategies regarding organizational climate
8. Staffing Programs	Strategies regarding staffing the organization
9. Training Programs	Strategies regarding motivating personnel
10. Motivation Programs	Strategies regarding motivating personnel
11. Compensation Programs	Strategies regarding compensation
12. Evaluation Programs	Strategies regarding personnel evaluation
13. Promotion Programs	Strategies regarding personnel promotion
14. Termination Programs	Strategies regarding personnel termination
15. Personnel Policy Budget	Financial implications of programs
16. Implementation Strategies	Strategies regarding program execution
17. Control Strategies	Strategies regarding execution review
18. Contingency Strategies	Strategies regarding alternative scenarios

Table 6
Financial Policy Structure

Financial Factor	Factor Description
1. Executive Summary	Succinct recaps of financial strategies
2. Historical Introduction	Brief reviews of past financial strategies
3. Strategic Policies	Summaries of relevant organization's strategies
4. Historical Analyses	Recaps of historical strategies and financial data
5. Situation Analyses	Review of external and internal environments
6. Cash Flow Programs	Strategies regarding cash flow
7. Working Capital Programs	Strategies regarding working capital
8. Debt Programs	Strategies regarding debt
9. Equity Programs	Strategies regarding equity
10. Investment Programs	Strategies regarding investments
11. Financial Integration Programs	Strategies regarding integration
12. Leasing Programs	Strategies regarding leasing
13. Audit Programs	Strategies regarding audits
14. Financial Controls Programs	Strategies regarding financial controls
15. Financial Policy Budget	Financial implications of programs
16. Implementation Strategy	Strategies regarding program execution
17. Control Strategy	Strategies regarding execution review
18. Contingency Strategy	Strategies regarding alternative scenarios

to hotel accommodations, major showrooms with extravagant productions, sports facilities, gourmet restaurants, or exclusive shops.

In contrast to this, Nevada gaming has been open from the start. Just about any game of chance is available in Nevada although slots, poker, and blackjack are the most popular games. The most dominant revenue maker is slots. And, in sharp contrast to their Dutch casino counterparts, Nevada casinos often will afford their gamers access to all of the amenities mentioned above. In fact, many Nevada properties contend that once the guest has arrived at their location, there should be no reason to leave -- under any pretence -- except to return home.

Marketing Policy Structure Target Markets

The initial target market was the "highroller," then attracted to the illegal casinos. Subsequently, market opportunities were broadened to include both the urban and foreign "highrollers." Beyond this, even to this date, little if any effort has been directed to any other market segments. In fact, the working class has been specifically neglected under regulations directed within the Dutch Parliament.

In sharp contrast to this, the location of Nevada casino properties has been dictated by a tremendously heterogeneous market, appealed to by a wide range of products, locations, amenities, prices, etc. Indeed, Nevada can be referred to as a supermarket for gaming tourists. The markets are diffuse, including locals vs. out-of-state as well as foreign gamers, transients vs. locals, low, middle, and high income rollers, etc. In fact, because of the high level of competition, casino properties have begun to engage in high degrees of "nitch marketing" in an attempt to find a particular market for themselves. Inasmuch as all elements of the population seem to enjoy casino-style gaming, casinos exist to appeal to these elements.

Product, Distribution, Pricing and Promotion Programs

In the Netherlands, a fairly distinct marketing mix is manifest. Historically, the products themselves were confined to baccarat, roulette and other "high class" games. There were no slots early on and many other games readily available to the Nevada gamer simply do not exist in the Netherlands.

The locations of the Dutch casinos were confined, in the beginning, to suburban and rural resorts, and only subsequently to major urban centers. No "gaming centers," as such, existed. In other words, casinos were relatively isolated from the mainstream of the Dutch population. More recently, this policy of the National Commission on Gaming Policy has been discontinued and a policy to expand casinos to include a variety of locations has been implemented.

In the Netherlands, Scheveningen -- a seaside suburb of The Hague -- was chosen as a casino site for several reasons. First, it was removed from a major city but still accessible from that city. Second, it had an historical tradition of appealing to high income tourists who came to the seaside to enjoy the beach and the historically lovely hotel, the Kurhaus. And, third, the Kurhaus was in serious need of repair and there was ample local support for the restoration thereof. The casino would be located in a very distinct section of the hotel.

The second location, Zandvoort, was also a seaside resort, accessible from Amsterdam, with a major hotel -- the Bowles -- which lacked the historical image of the Kurhaus but still needed major revitalization.

The third location, Valkenburg, would provide the Netherlands with some semblance of geographical balance since Valkenburg was a remote resort town in the Limburg forest region of the south of the country. Its selection ensured that the parliament could not be charged with geographical favoritism or discrimination of any sort.

Pricing in the Netherlands contrasts sharply with Nevada pricing. To begin with, gamers are immediately subjected to an entrance fee, strict dress standards, a complete lack of amenities, and a relatively high cost to reach the semi-isolated casino locations. Once within the casino, gaming limits are quite high, and there are no such "pricing strategies" as complementary gifts -- better known as "comps" in Nevada.

In the area of promotion, advertising by Dutch casinos is severely restricted, and publicity and public relations are played down as a matter of public policy.

In contrast to this rather restricted marketing mix in the Netherlands, the marketing mix of Nevada casinos is relatively open. As indicated earlier, Nevada casinos offer a wide range of gaming activities intended for the entire spectrum of gaming markets.

There is no such thing as a state-wide location policy administered within Nevada, compared to that of the Netherlands. However, national acceptance of gaming in Nevada was based in part on the fact that the major communities of Nevada -- if they could be called that in the beginning -- were isolated from the rest of the nation, with Los Angeles to the southwest and San Francisco, Oakland, and Sacramento to the west, as much as three hundred miles removed, and with Salt Lake City to the northeast and Phoenix to the southeast, both at least three hundred miles removed. There would be no state locational policy, just locations that were a function of the natural geographical terrain and demographic composition of the State of Nevada -- wide open and far removed.

Nevada casinos emerged within the state based exclusively on perceived or potential profits. As such, casinos were located in such obscure locations as Jackpot, Jean, Sloan, Stateline, Mesquite, Tonopah and in the more central locations of Las Vegas, Reno, Carson City, and Lake Tahoe. Despite the openness of the state, one is rarely more than about fifty miles in any direction from a casino of some size.

Nevada casinos do not have entry fees. Gaming limits can range from the very lowest to customer-selected very highest. There is no significant dress standard, amenities are in abundance, and high rollers are offered numerous "comps" for the extent of their play.

Promotion within the State of Nevada is fairly laissez-faire although out-of-state restrictions abound in the areas of the use

of the mass media and direct mail through the U. S. Postal Service. Publicity and public relations are exploited to their fullest within the state up to and including the welcoming of bad publicity as a part of a predetermined promotional formula.

Operations Policy Structure and Physical Facilities Programs

In the Netherlands, casinos tend to be independent of other consumer attractions, although they are often located adjacent to or within some hotels, such as in Rotterdam. If adjacent facilities, such as night clubs, sports facilities, or specialty shops, exist, it appears that they do so by pure circumstance. From an institutional marketing point of view, it could be said that Dutch casinos were all intended to be specialty institutions -- involving specialty products, fairly high prices, extensive search effort on the part of consumers, and infrequent purchases.

In contrast, Nevada casinos vary from tourist destination complexes, employing all of the facilities listed above, to truly convenience-based institutions located as to intercept any traveller or convention attender. The Nevada situation is characterized by convenience products and fairly low prices. Search effort is limited to a bare minimum, including opportunities for impulse purchases, and frequent purchases. Visitors to Las Vegas would be surprised at the location of slots in grocery stores, laundromats, and similar convenience outlets. Indeed, Las Vegas would seem to be a "supermarket" of gaming alternatives.

Capital Equipment Programs

Specific plant equipment of the typical Dutch casino is "spartan." There is very little of the glitter and glamour associated with casinos in Las Vegas. Many of the Las Vegas casinos are, in fact, extremely grandiose, including the most recently constructed, e.g. the Mirage.

Research and Development Programs

In the Netherlands, research and development is a function of parliamentary decree. Otherwise, there is very little evidence of product or market research and development.

Nevada properties, both individually and collectively (through the Las Vegas Convention and Visitors Authority and/or the Nevada Resort Association), are constantly engaged in both product and market research and development, constantly probing, ever on the lookout for any market shifts or any evidence of untapped markets consistent with the institution's existing markets or marketing plans.

Personnel Policy Structure: Staffing Programs

In the Netherlands, any personnel with prior work experience at the illegal casinos are automatically excluded from employment and foreigners have been barred from employment as well. The casinos are a singular organization operated under the jurisdiction of the federal government and are, therefore, an automatic extension of both domestic and foreign policy.

The Nevada casino employment system is wide open. Potential employees must have documentation necessary for employment, including the work permit, but this appears available to just about anyone interested in working. Once employed, a gaming employee is exposed to some unionization.

Compensation Programs

Dutch casino employees are compensated out of a common nationwide tip pool rather than any form of salary or wages. The selection of games offered can very well affect the level of compensation. The presence of slot machines creates a basic problem in compensation inasmuch as there is no input from the casino staff. In contrast, the table games do permit some input and/or influence from the casino staff that could affect the amount of the tip pool. Casino staff members are not without input, however, since there is a Dutch Dealers' Association through which grievances may be registered and matters pertaining to employment resolved.

Nevada compensation is provided through salary and tips. Employees cannot influence games chosen by the players. In fact, casino staff members are discouraged from social encouragement of any form directed at casino players.

Promotion Programs

The Dutch casino promotion system is closed, that is, restricted to promotion from within. This automatically discourages job jumping. If one quits a particular position, a return to that position is nearly impossible. One must begin at the bottom - if, in fact, a position is available.

Nevada enjoys a fluid promotion system, horizontally and vertically. Employees are hired from within and without for middle and upper level positions. Quite often, the move of a top management person from one casino to another will result in the movement of an entire "team" of employees to the new casino. Should one leave a particular position, one may return to that or even a higher position. It should be noted that personal persuasion or influence--better known in some circles as "juice"--can be quite important in the employment status of an individual.

Financial Policy Structure: Working Capital, Debt and Equity Programs

All casinos in the Netherlands are owned by the federal government, and all financing is obtained directly from that source. In the United States, highly leveraged junk bonds have been used--as in the case of the Mirage Hotel and Casino--and many casinos use multiple sources of debt capital.

Historically, in Nevada, considerable funding was through institutions heavily influenced by organized crime. Cases in point have included a number of the union trust and health and care funds. This has changed with the advent of the corporate owners, listing of some of the major casinos on major stock exchanges, and participation of local and regional banks in debt financing.

Financial Controls Programs

Internal controls also constitute a study in contrast. In the Netherlands, inasmuch as the casinos are owned by the federal government, they are also controlled by parliamentary decisions and actions.

In contract, the casinos of Nevada are operated within an environment that is laissez-faire. Statewide gaming control boards and commissions lack the resources for constant monitoring and enforcement tends to be selective. Self-regulation and regulation by complaint are the prevailing methods of control.

Similarities and Differences: Explanations, Implications and Recommendations

The primary purpose of this series of applications to the model has resulted in the identification of numerous similarities and differences and explanations thereof. Implications have been listed in some instances while simply inferred in others. From the exercise, recognizing that it has been only a partial demonstration of the application of the model, certain recommendations are forthcoming. In particular, the Dutch experience has had a number of problems which can only be overcome by a reorganization of the system and a rethinking of the goals and objectives of casino gaming in the Netherlands.

It is evident that the Dutch casinos do not compete very successfully with the illegal casinos since the latter continue to thrive to some degree. Further, it is evident that not using any of the employees previously employed by the illegal casinos can have some major drawbacks, namely, incompetent employees dealing with the gaming public. Still further, it is evident that these casinos have become more popular and could become useful sources of foreign exchange as they continue to draw gamers from foreign gaming casinos and reduce the number of Dutch gamers who, heretofore, had to seek gaming options abroad. Finally, such a redirection of goals and objectives should result in some major changes in promotion such as major improvements in both the quality and quantity of advertising.

As for the gaming industry in the State of Nevada, the regulated, yet rigorous competition has resulted in a dynamic industry, not only statewide but in comparsion with out-of-state as well as foreign properties. With growing competition from other states seeking alternative forms of gaming up to and including casino-type gaming, the State of Nevada and its respective component institutions must remain vigilant in perpetuating the success of the past and present. Any attempts to increase regulation or discourage entry must themselves be discouraged. As an old adage goes, "If it is not broken, do not fix it."

Summary

The nature of legalized gaming in the United States and the world is currently undergoing a profound change. This change is being caused by contemporary fundamental changes in the social, political, economic, and technological environments affecting gaming activities. All of these environmental changes impact upon government and corporate decision makers concerned with making gaming related decisions. The dynamic nature of gaming markets and the gaming industry indicates a need for timely and improved understanding, reporting, and planning with respect to gaming phenomena.

The global analytical framework presented in this paper is a business tool that can be used to monitor and analyze dynamic gaming phenomena. It can be used by academicians, writers, reporters, and corporate, financial, and government decision makers in order to improve their understanding of the nature of the gaming market.

The global framework indicates the major business factors and factor interrelationships involved in managing a gaming organization. Each factor contains a universal set of variables as well as specific variables relevant to that factor. Groups of factors are clustered together to form major components of the framework.

The six components of the global analytical framework (comprising the factors and variables of the business tool) can be applied to any gaming unit, i.e., any gaming (business) organization, group of gaming organizations, or political jurisdiction (e.g., city, county, state, country, or group of countries). The questions inherent in the nature of the framework can serve as the basis for investigation or be posed to the relevant authorities of any type of gaming unit (such as casino gaming or lottery) or any level of gaming unit (such as an organization or a country).

At any type or level of unit analysis, the global framework can be used to describe one or more units of analysis. The framework can also be used to generate similarities and differences across analytical units. When appropriate, the analyst can proceed to discuss implications of the findings, and in certain situations, make recommendations.

Simple applications of the framework are presented and discussed by comparing gaming in the Netherlands in the European Economic Community and the City of Las Vegas in the State of Nevada, in the United States. The result is the identification and explanation of numerous similarities and differences between the gaming jurisdictions.

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The Economic Effects of the Southern Pacific Santa Fe Railroad Merger

*by Herbert E. Gishlick and Charles W. McCall**

Introduction

On Dec. 23, 1983, two large railroad holding companies, Santa Fe Industries and the Southern Pacific Company, were merged to create the Santa Fe Southern Pacific Corporation. Because each of these predecessor companies owned a railroad, they needed formal I.C.C. approval to merge their respective railroad companies, the Atchison Topeka and Santa Fe Railway Company (ATSF) and the Southern Pacific Transportation Company (SPT), into a single railroad, the Southern Pacific Santa Fe Railroad (SPSF). Pending this approval, the stock of the Southern Pacific Transportation Company was placed in a voting trust supervised by an independent trustee. On March 22, 1984, the control and merger application was filed.[1]

The 25,000-plus-mile railway system which would have been created by this parallel merger was opposed by rival western railroads, by some, but not all shipper groups, and by the U.S. Department of Justice. In contrast, the U.S. Department of Transportation supported the merger. On July 24, 1986, the I.C.C., in a surprising ruling, turned down the proposed merger by a 4 to 1 vote with Chairman Heather J. Gradison providing the only dissenting voice. The I.C.C. decision indicated that the anticompetitive aspects of the merger outweighed the public benefits.

This denial was a surprise to many. The following quote from the trade press captured the unexpectedness of the merger denial.

> Given the I.C.C. decisions that led to creation of Burlington Northern and Union Pacific, systems created through merger it was a 'given' that Santa Fe and SPT would be allowed to merge. The questions -- among analysts, in the press, among competing railroads and even at parent Santa Fe Southern Pacific Corporation -- had mostly to do with the conditions that might be imposed.[2]

This article critically examines the competitive effects of the proposed merger. The market definition methodologies of the applicant railroads and the I.C.C. will be analyzed and compared to the approach recommended in the 1984 Department of Justice Merger Guidelines. The negative welfare effects of increased market power will then be compared to merger generated efficiencies. The financial health of the railroads will be considered to see whether the "failing firm" doctrine would be applicable in this case. The paper concludes with an examination of the ICC's reasoning in disallowing the merger and a short epilogue recounting subsequent events.

Pre-Merger Rail Geography

The I.C.C. identified five high density traffic origination-destination clusters in the area of the proposed merger. They are: (1) Central Corridor (Northern California and Oregon through Ogden and Salt Lake City to the Chicago, Kansas City and St. Louis gateways); (2) Southern Corridor (California through Arizona, New Mexico, Texas, Louisiana and Arkansas to the gateways of New Orleans and Memphis); (3) Pacific Coast Corridor (Washington, Oregon and California); (4) Intrastate California Corridor (Bay Area to the Los Angeles Basin); and (5) Midwest North-South Corridor (Kansas to Louisiana and Texas, including Texas border crossings to Mexico).[3] Figure 1 (following page) details the major routes (including existing trackage rights) of both the applicants and those railroads seeking to prevent the merger unless certain conditions were met.

Figure 1 shows that the proposed merger was clearly parallel (horizontal) in the Southern Corridor and would create a rail monopoly over this route. This map also shows that the extent of any adverse welfare effects of a Southern Corridor rail monopoly would depend in part on whether rail routes through the Central Corridor were viable competitive alternatives to the Southern Corridor rail route. There is considerable evidence that suggests that Central Corridor routes are not competitive with the Southern Corridor, especially for traffic moving to the Southeast and Gulf Coast areas. Table 1 shows the predominant role of the Southern Corridor for rail traffic between the Los Angeles-San Francisco Bay Area and points in the Southeast and Southwest.

Table 1
SPSF Rail Market Share[4]

Route	Origination	Termination
L.A. Basin-Southeast	95%	90%
L.A. Basin-Texas, Oklahoma Arkansas, Louisiana	100%	95%
San Francisco-Dallas, Gulf	95%	95%

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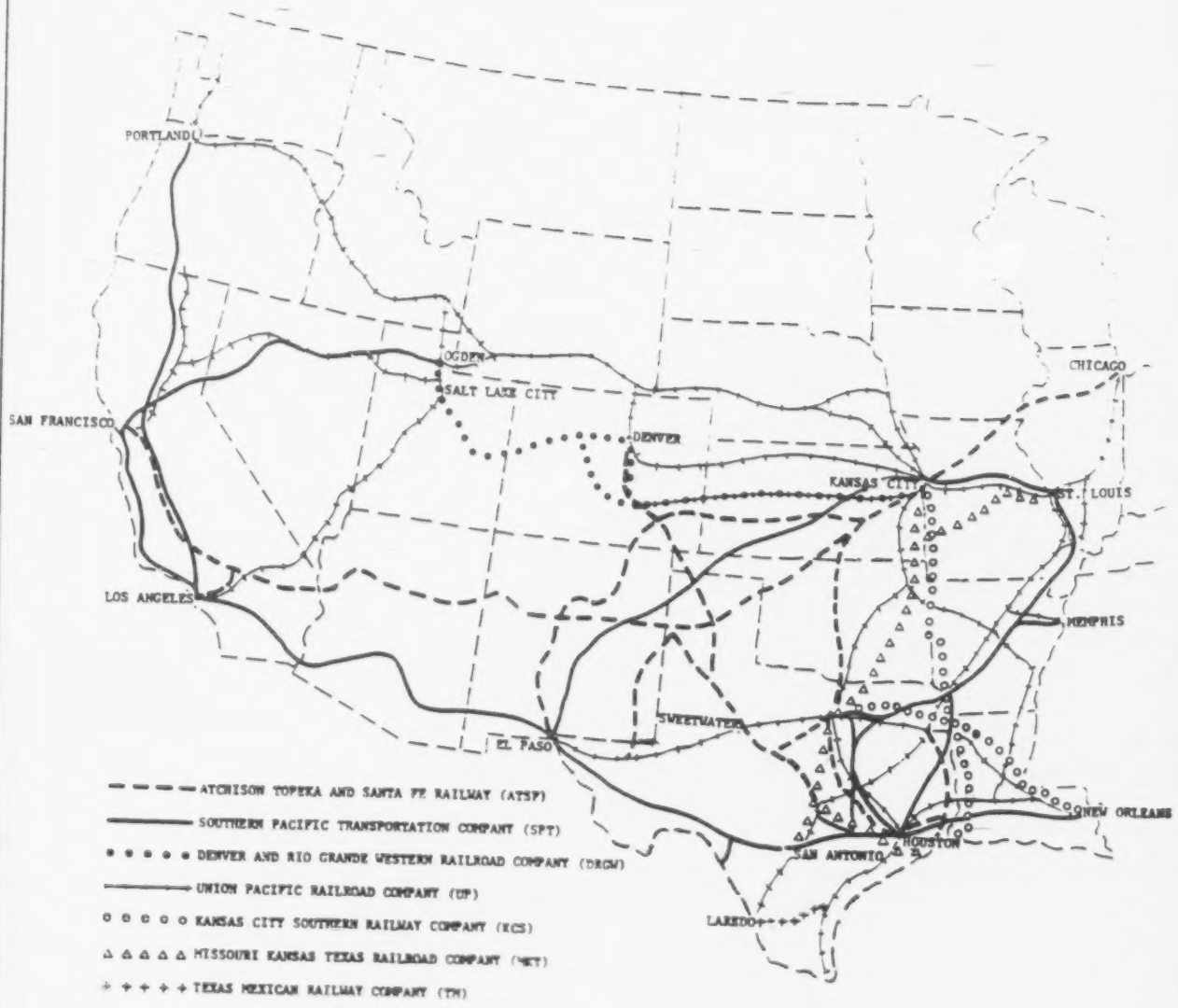
Figure 1


PORTLAND
OGDEN
SALT LAKE CITY
SAN FRANCISCO
DENVER
CHICAGO
KANSAS CITY
ST. LOUIS
LOS ANGELES
MEMPHIS
SWEETWATER
EL PASO
NEW ORLEANS
SAN ANTONIO
HOUSTON
LAREDO
ATCHISON TOPEKA AND SANTA FE RAILWAY (ATSF)
SOUTHERN PACIFIC TRANSPORTATION COMPANY (SPT)
DENVER AND RIO GRANDE WESTERN RAILROAD COMPANY (DRGW)
UNION PACIFIC RAILROAD COMPANY (UP)
KANSAS CITY SOUTHERN RAILWAY COMPANY (KCS)
MISSOURI KANSAS TEXAS RAILROAD COMPANY (MKT)
TEXAS MEXICAN RAILWAY COMPANY (TM)

A comparison of the route mileage between city pairs over the two corridors and, by inference, trip time differential, further supports the notion that the Southern and Central Corridors are not competitive routes.

Table 2[5]
Inter-Corridor Route Mileage Comparison

City Pair	Carrier	Corridor	Mileage
L.A. Houston	UP –	Central	2,768
L.A. Houston	SPSF	Southern	1,625
LA-Dallas	UP	Central	2,541
LA-Dallas	SPSF	Southern	1,641
LA-New Orleans	UP	Central	2,944
LA-New Orleans	SPSF	Southern	1,978
San Francisco-Houston	UP	Central	2,900
San Francisco-Houston	SPSF	Southern	2,000

The testimony of individual shippers offers additional evidence that the Southern and Central Corridors constitute non-competing rail routes. National Piggyback Service (NPS) shipped about 20,000 trailers in 1983 between Los Angeles and the Dallas-Houston-New Orleans area.[6] NPS used the Southern Corridor for all of this traffic because the Central Corridor is too circuitous to compete for this NPS business.[7]

American Presidential Lines (APL) ships almost 100 percent of its Asia-Gulf mini-landbridge traffic over the Southern Corridor, using both the SPT and the ATSF.[8] The UP does not even bid on this traffic because its rates over the Central Corridor are 60 percent higher than SPT and ATSF rates over the Southern Corridor.[9] Finally there is precedent for finding that the Southern and Central Corridors are separate geographic markets. In UP Control, the I.C.C. ruled that the Central Corridor was a separate geographic market.[10]

The third high traffic density cluster is described by the I.C.C. as comprising two corridors, an intra-state California Corridor and an interstate California-Pacific Northwest Corridor. Reference to Figure 1 shows the possible routes serving these corridors. The SPT provides single line service between the Los Angeles Basin and Portland. The ATSF provides service to the Los Angeles Basin via Barstow, connecting with the UP at Stockton and later connecting with the BN at Bieber, Calif. From Bieber, the route continues to Oregon and Washington and to points throughout the Pacific Northwest. The UP provides inland service between the Los Angeles Basin and Portland via Salt Lake City and Ogden. As Figure 1 shows, one obvious question is the substitutability of the inland UP route with the SPT and ATSF routes. The tonnage origination-destination evidence in Table 3 shows that the UP route is not in the same geographic market as the SPT and ATSF routes because of the minimal UP share of this traffic.

Table 3[11]
Rail Origination-Termination Market Shares

City Pair	Carrier	Origination Share %	Termination Share %
L.A. Basin-Washington	SPT	68.0	58.6
	ATSF	24.5	29.2
	UP	7.4	11.3
L.A. Basin-Oregon	SPT	81.8	90.8
	ATSF	16.8	6.7
	UP	1.4	2.5

Along the Pacific Coast the SPSF merger would have horizontal consequences (as shown by Table 3) and also possible vertical foreclosure between the ATSF and the UP. Moreover, in intrastate California, the applicants were found to control a 90.2 percent share of the rail traffic.[12]

The final high traffic density area is between Kansas and Missouri on the north and the Gulf Coast-Texas Mexico border crossings on the south. There are five railroads operating in this six-state north-south corridor: the ATSF, the SPT, the UP, the MKT and the KCS. The Midwest North-South Corridor consists of (1) traffic moving between Kansas and Texas, including traffic originating on the SPT with a ATSF-MKT routing[13] and (2) USA-Mexico traffic moving to and from the border crossings at Laredo, Eagle Pass and Corpus Christi via interline movement over MKT and TM.[14] Routes further west than Kansas and Oklahoma do not compete for this traffic. The same is true for North-South rail routes east of Missouri, Arkansas, and Louisiana. Within this Midwest Corridor, the SPSF merger could have both horizontal and vertical effects.

Market Definition

In order to accurately assess the competitive effects of a merger it is essential that the market be correctly defined. The overall objective of market definition is the determination of the number of competing firms and products and the geographic area in which these firms compete. This kind of analysis is necessary in order to determine the amount of business activity (if any) that would be vulnerable to post-merger price increases.

The 1980 Staggers Act raised the level of importance of market definition in railroad mergers. This law, which addressed many issues related to railroad deregulation, required that in addition to the traditional public interest standard, the I.C.C. was to place greater weight on the competitive impact of merger activity. Accurate market definition is a prerequisite for achieving this objective. The Staggers Act also created a mechanism to give both the Department of Transportation and the Justice Department the ability "...to intervene as a party to the (merger) proceeding."[15] Thus, in the Post-Staggers Era, the Departments of Transportation and Justice have been empow-

ered to offer opinions and analysis to be used by the I.C.C. in its merger deliberations.

Since the issue of market definition is important in this case both the methodologies of the applicants and the I.C.C. will be closely examined. For reasons discussed below, however, both of these approaches contain errors and result in a miscalculation in the amount of traffic that would be susceptible to post-merger price increases. The Department of Justice Merger Guidelines, on the other hand, provide an economically justifiable framework for market definition. Given the change in the role of the Justice Department in the Post-Staggers era, these Guidelines will therefore be explained and the results of a study applying this framework will be discussed.

The applicants used a system of "screens" to determine the amount of post-merger traffic for which there would be no inter- or intra-modal competition. This "residual" volume approach purportedly leads to the determination of the traffic over which the merged firm could exert its market power. A small residual volume would suggest negligible anti-competitive effects. This conclusion is warranted only if the residual volume calculation rests on a sound economic foundation. In this case, many of the screens employed by the applicants in estimating the residual volume are seriously flawed.

Applicants excluded all "exempt" traffic from the residual volume calculation. Under 49 U.S.C. p. 10505 (a), the I.C.C. can grant rate exemptions when there is sufficient competition to protect shippers from abusive rail market power. In these situations shippers do not need regulatory protection. The applicants maintained that with exemptions granted because of the existence of intermodal competition, such traffic should not be included in the residual volume because there would be no post-merger anti-competitive effects. Exclusion of this traffic from the residual volume calculation is in error for two reasons. First, exemptions are granted by the I.C.C. based on both intermodal and intramodal competition.[16] This suggests that pre-merger competition between the ATSF and the SPT could have led to the I.C.C. granting an exemption. Clearly, such traffic could be subject to post-merger market abuse. The second problem here is that the exclusion of all exempt traffic due to intermodal competition is based on a pre-merger picture of the market. No attempt is made to measure the post-merger strength of this competition. Without this information, it would be inaccurate to exclude all of this traffic from the residual volume because there could be an adverse market power effect short of pure monopoly.

Another screen used by the applicants to calculate residual volume was based on a market dominance standard. Applicants argued that any traffic priced below a 180 percent revenue to variable cost threshold should not be included in the residual volume.[17] The reasoning underlying this argument is that there are competitive forces in the market keeping prices below this threshold level. The problem with this approach is again that post-merger market power is ignored. The reason that pre-merger traffic rates in an area were below the threshold might well have been due to competition between the ATSF and the SPT. After the merger, this competition would be eliminated and rates could rise well above the 180 percent threshold. It is therefore erroneous to exclude all of this traffic from the residual volume.

Applicants also used the Standard Transportation Classification Code (STCC) in computing the residual volume. This screen examined traffic at the two-digit level of the STCC. If more than 50 percent of this traffic was moved by a non-rail mode, it was excluded from the residual volume.[18] This is a very crude screen and suffers from two serious shortcomings. The first problem is again related to the difference between the pre-merger and post-merger environment. Assume that pre-merger, the non-rail market share is 51 percent and that the rail share of 49 percent is split between two firms. The merger would reduce the number of rail options available to shippers to one with the merged firm's market share increasing to 49 percent. It is implausible to suggest that there could never be an abuse of market power in this scenario.

An additional problem has to do with the use of the two-digit level of the STCC. The two-digit level is so broad that some commodities within a two-digit category could move exclusively by rail while other commodities within the same category could move exclusively by truck.

The last screen used to calculate residual volume was based on the rationale that any containerized traffic or any commodity that had the potential to be containerized should be excluded from residual volume because all such traffic would be truck sensitive.[19] This actual or potential truck competition would provide effective post-merger competition. This exclusionary rule, like some of the other screens used by the applicants, is too crude. No determination was made of the economic feasibility of containerizing items. Without this information, it would be impossible to exclude all of this traffic from the residual volume.

On the basis of the foregoing analysis, the applicants claim that the relevant market should be broadly defined as freight transportation, not the more narrow rail-only definition. Furthermore, the applicants argue that in the relevant markets, the SPSF would be faced with substantial intermodal and intramodal competition which would mitigate any anti-competitive consequences of the merger. By the use of this screen methodology, the applicants showed that there would be a relatively small volume of traffic, 3.14 million tons, or 1.7 percent of the total tonnage exposed to hypothetical rate increases above competitive levels. They later reduced this figure to 2.2 million tons or 1.2 percent of total tonnage that would be vulnerable to abusive SPSF post-merger market power.[20] Based on the criticisms mentioned above, the applicants significantly underestimated the volume of vulnerable traffic.

The I.C.C. was highly critical of the market definition methodology used by the applicants and rejected the conclusion that the market was freight transportation. Relying primarily on a case study type of methodology, the I.C.C. narrowly defined the relevant market as rail transportation. The case study evidence considered by the I.C.C. included the testimony of individual shippers, such as Sunkist, Calcot, National Piggyback Service (NPS), and American Presidential Lines (APL).

Sunkist Growers, Inc. ships about 60 percent of its San Joaquin Valley perishable output to markets in the Northeast.[21] The rail share of this traffic is between 70 percent and 97 percent.[22] Sunkist has found that trucking is not a viable competitor for most of this traffic and consequently relies heavily on the ATSF and the SPT for shipment to the Northeast and Canada.

Calcot is a 3,600-member cotton marketing cooperative. Annual Calcot traffic volume is in the neighborhood of 5,000 boxcars per year.[23] Calcot has found that trucks are not strong rail rivals for this traffic and handle only about 15% of the annual volume.[24] The ineffectiveness of truck competition is due to higher price, smaller than boxcar capacity, and insufficient overall truck capacity during peak demand.

NPS operates in almost every major metropolitan corridor, handling about 200,000 trailer loads per year.[25] In 1983, NPS shipped 76,000 trailers over the Southern Corridor using the SPT and the ATSF.[26] Rail rates for this trailer on flat car (TOFC) traffic ranged between $.75 and $.85 per mile.[27] Truck rates over this route ranged between $1.00 to 1.54 per mile.[28] This rate disparity shows that trucks do not effectively compete with railroads for this traffic.

APL's Orient to Gulf Coast traffic is handled almost exclusively by rail over the Southern Corridor. APL testified that trucking is not a viable alternative for this traffic. Long-haul truck rates over the same route are 80 percent to 90 percent higher than rail rates.[29] In addition, trucks would face enormous logistical problems in handling APL traffic. The capacity of an APL vessel can run as high as 3,200 TEU (twenty foot equivalent unit) containers. Truck capacity is two TEU containers. This would require hundreds of trucks at dockside and the subsequent coordination of this traffic.

APL testimony also indicates that water transportation via the Panama Canal is not considered a competitive option for minilandbridge (MLB) service over the Southern Corridor. While some Orient-Gulf Coast traffic does move by water via the Panama Canal, it is limited to commodities that are not containerizable. Water service via the Panama Canal is less frequent, slower and more expensive. The water route is 2.5 times longer than the rail option.[30] The Southern Corridor rail MLB rate is $1,100 per TEU compared to $1,325 per TEU for water service.[31]

Two other factors that had an impact on the market definition adopted by the I.C.C. are the UP Control decision and the length of haul data. In UP Control, the I.C.C. ruled that the Central Corridor did represent a separate geographic market and that the relevant product market was rail.[32] Thus, there was precedent for the I.C.C.'s product market definition in part of the geographic area affected by the merger.

Finally, data were presented by the DRGW that indicated that intercity truck traffic was heavily concentrated in routes under 1,000 miles.[33] This evidence suggests that railroads would face little truck competition on routes longer than 1,000 miles.

The I.C.C.'s rail only market definition seems to rest primarily on the testimony of a limited number of shippers. While the record is clear that this small group of shippers did not perceive trucks to be effective competitors for railroads, it is inappropriate to base a market definition on such limited case study evidence. The I.C.C. did not provide any data on the relative magnitude of traffic controlled by these shippers in the different geographic corridors. Without this information, it is impossible to determine the degree of intermodal competition.

In 1982, the Department of Justice proposed a set of guidelines to be used in analyzing the economic effects of mergers. These guidelines were slightly revised in 1984. One key aspect of these guidelines deals with the issue of market definition.[34] The DOJ recommended that the relevant market be defined as the smallest group of firms, acting together, that could raise price by at least 5 percent and maintain that price increase for at least one year. In order to apply this Department of Justice definition to a railroad merger, it would be necessary to examine the kinds of commodities shipped through the different corridors, the length of haul, and the possibility of source competition.[35] With this information it would be possible to estimate the volume of traffic that would not be sensitive to actual or potential inter- and intra-modal competition and would therefore be vulnerable to post-merger adverse market power effects.

In a recent study, R. Pittman estimated both the volume of such traffic and the resultant welfare effects.[36] Using 1985 sample waybill data compiled by the I.C.C., Pittman examined the characteristics of the commodities shipped through the merger-affected corridors and determined the volume of traffic that would not be vulnerable to intermodal or source competition. Intramodal competition was only considered to be effective if there were three or more rail options for an origination--destination city pair.[37] With this approach, Pittman estimated that 35.3 million tons of traffic worth about $2.24 billion would face significantly less competition after the merger.[38] With assumptions about pre- and post-merger price levels and demand elasticities, it is possible to estimate the merger-related welfare loss on this volume of traffic. Pittman assumed a 20 percent post-merger price increase, a pre-merger price to marginal cost ratio of 1.34, and own price elasticities between -.5 and -1.[39] With these assumptions, the welfare loss as a result of the merger would be between $483 million and $518 million.[40] This would represent about 10 percent of the combined 1984 railroad operating income of the SPT and the ATSF.[41]

Table 4 shows the wide range in the estimates of the competitive harm from the proposed merger. The applicants and the Department of Transportation (DOT) used the same screen methodology and argue that the market should be broadly defined to include all forms of freight transportation. With this definition of the market, very little traffic would be vulnerable to SPSF market power after the merger. However, as was discussed above, the errors in the application of this screen technique raise serious doubts about the accuracy of a broad definition of the market in this case. It is believed that reliance on this broad market definition would result in a significant underestimate of the exposed tonnage and the welfare loss due to the merger.

The I.C.C. presented case study evidence suggesting the

Table 4[42]
Estimates of Exposed Tonnage and Welfare Loss

Source	Exposed Tonnage (millions)	% Exposed Tonnage to Total	Welfare Loss $ Millions
SFSP-49	2.2	1.2	3.26
TBS (SFSP-16)	3.14	1.7	4.66
(DOT-3)	4.8	2.6	7.12
(DJ-7)	15.7	8.4	23.30
Pittman	35.3	19.3	483.-518.

market should be defined as rail only. However, the limited scope of the supporting evidence does not engender much confidence in this conclusion. Furthermore, the I.C.C. did not attempt to apply this definition to estimate the welfare effects of the merger.

Both the DOJ and Pittman used the market definition criteria contained in the 1984 Merger Guidelines. To apply this framework, the characteristics of the commodities shipped through the merger affected areas were examined. This approach provides the best estimate of the volume of traffic vulnerable to SPSF market power after the merger.

While the DOJ and Pittman used the same market definition methodology, Pittman had access to more comprehensive traffic data that were not available at the time of the hearing. Consequently, Pittman's estimates may provide a more accurate assessment of the competitive harm from the proposed merger. A comparison of this welfare loss with merger-related efficiencies will show the net welfare effect of the merger.

Public Benefits Resulting from the Merger

Many commentators are skeptical about claims of efficiencies resulting from horizontal mergers.[43] Two important issues have to be considered in estimating merger-related efficiencies. First, are the benefits public in nature or do they simply accrue to the merger partners? Only public benefits that result in the economy of societal resources should be included. Second, it is important to question whether these social benefits could be achieved by a means other than horizontal merger. The SFSP claimed that the public benefits from this merger would result in annual savings of $277.8 million.[44] The DOJ showed that the SFSP estimate was overstated in that it included some benefits that were strictly private in nature. Table 5 excludes these private benefits and shows the estimated public benefits.

The I.C.C. noted the general accuracy of the estimated public benefits except for the treatment of traffic diversion benefits. The SFSP argued that the diversion of traffic from rival railroads to the merged system would produce efficiency gains because of the SFSP's ability to carry this traffic at lower operating costs. The SFSP also argued that this diversion of traffic would not have a negative impact on the financial health of rival railroads.

Table 5[45]
Projected Annual Merger Savings

	Amounts in Millons of $
Internal reroutes	$ 57.7
Yard and local switching	22.3
Equipment utilization	25.1
Engineering coordinations	21.9
Mechanical coordinations	1.8
Non-operating and miscellaneous	53.1
Information systems	6.3
Total	**$188.2**
Plus traffic diversion "benefits"	56.2
Total public merger benefits	**$244.4**

In disagreeing with the SFSP position, the I.C.C. explained that it is incorrect to assume, as the applicants did, that a loss of revenue from diverted carloads is offset by an equal reduction in expenses from no longer handling the traffic.[46] Provided that the traffic subject to diversion is being handled by protestants at favorable revenue-to-variable cost ratios, the private revenue benefits to the merged system from the added traffic do represent economic losses to those carriers. At the same time these revenue losses are not offset on a dollar-for-dollar basis by a corresponding decrease in variable costs.[47]

The I.C.C. concludes, "At best, applicants' $56.2 million public benefit from diversion is an intangible savings that must be offset by costs to respondent applicants. This has not been done."[48] Thus, the I.C.C. only accepted the $188.2 million figure as the reasonable annual amount that can be considered as public benefits associated with the merger.[49] Regardless which estimate is used to measure the public benefits, Pittman's estimate of the welfare loss shows that the benefit-cost ratio from this merger would be less than one.

Vertical Foreclosure

In addition to the adverse market power effects from the horizontal aspects of this merger, there was also the possibility of a condition analagous to vertical foreclosure arising in the Central Corridor. After the UP/MP/WP merger in 1983, the DRGW lost its traditional western connection, the Western Pacific, and became almost completely dependent on the SPT for the interchange of traffic at Ogden. If the ATSF and the SPT merged, there was concern that the SPT would divert much of this traffic to the Southern Corridor.

In fact, it was reported that the annual revenue of Rio Grande Industries fell about 20 percent from 1983 to 1987 (one of the largest declines among Class One railroads).[50] Based on an internal SPSF document, the I.C.C. found that this concern was warranted.[51]

The document indicated that the SPT anticipated the ter-

mination of CP conditions with the DRGW and the end of their joint solicitation agreement.[52] The SPT planned to favor a Southern Corridor route (versus the Central Corridor) in order to take advantage of the greater revenue potential to the railroad from single line hauls compared to joint rail movement, which would not necessarily result in lower rates to the shipper. This traffic diversion could threaten the ability of the DRGW to survive in the transcontinental market. The elimination of or weakening of the DRGW would strengthen the market power of the UP in the Central Corridor. Although it was possible that a merged SPSF would want to maintain this alternative routing or to perhaps even acquire the DRGW should it be in danger of failing in order to maintain its presence as a central corridor competitor, this scenario would be highly doubtful. Within a year of the initial announcement of the intent of the Santa Fe and Southern Pacific to merge, it was reported that the DRGW was unable to interest another railroad in taking it over and was hoping to expand by gaining rights over the Southern Pacific between Ogden, Utah and the San Francisco Bay as a condition of the Southern Pacific Santa Fe merger.[53] The more likely outcome should the DRGW fail as an independent carrier would be the acquisition by other carriers of the traffic generating segments of the DRGW at its eastern and western ends. The DRGW's transcontinental route itself with its relatively steep grades and numerous tunnels would probably become redundant and be eliminated. The DRGW, without a guaranteed western connection, would not be able to survive as an alternative transcontinental railway.

Financial Considerations

A final set of reasons advanced by the applicants in support of the merger focused on the failing firm, weakened competitor and revenue adequacy issues. The applicants argued that the I.C.C. should approve the merger, regardless of its anti-competitive effects, because the failing firm doctrine provides that the imminent failure of a merging company may serve as a basis for approving a merger despite its anti-competitive aspects.[54] In addition, the applicants argued that market-share evidence should be given less weight in evaluating anti-competitive effects because the SPT was financially weak.[55] The argument was that one "principle of antitrust law is that the poor financial health of a company may significantly diminish the reliability of its present market share as a measure of market power."[56] Finally, the applicants argued that both railroads were revenue inadequate by I.C.C. standards and must be given the ability to "increase more of their rates above long run marginal costs."[57]

In its decision, the I.C.C. gave little credence to the substance of these financial issues insofar as they might provide mitigating circumstances vis à vis the anti-competitive effects of the proposed merger. Specifically, the I.C.C. noted the apparent discrepancies between (1) the July 1985 testimony by SFSP's chairman that the SPT was in bankruptcy at the time; (2) the December 1985 final briefs filed by SFSP arguing that the SPT was a failing company[58]; and (3) testimony filed in the U.S. District Court for the District of Columbia on December 1983 by SPT's Vice President and treasurer when the applicants were seeking merger of their holding companies.

This last testimony stated that the "SPT, with its stock in trust, will be as it is today, a significant and financially viable business. SPT, on its own, has an asset base and the financial capacity to not merely survive, but to vigorously compete with other large western railroads and motor carriers."[59]

SPT's chairman and Chief executive officer noted that, "Even if SPT were ultimately to emerge [from the voting trust] as an independent railroad, SPT's financial position is sufficiently strong that it could continue indefinitely as an independent competitor."[60] The I.C.C. found no financial evidence to support such a dramatic change in the firm's fortunes over the 1983-1985 period. The I.C.C., moreover, noted:

> Having given public assurances as to SPT's financial viability as an independent railroad in December 1983, the applicants arguably incurred a correlative obligation. At the point thereafter that they seriously anticipated bankruptcy by SPT absent merger, SPT and SFSP were required to make a public statement to that effect, if not in an 8-K Report, then in a 10-Q or 10-K Report filed with the SEC. Instead, SFSP's and SPT's filings with the SEC do not mention any deterioration in SPT's ability to compete effectively for rail traffic nor the allegation that SPT may soon become unable to pay its obligations as they come due.[61]

In sum, no evidence was presented to justify the failing firm doctrine as applied by the courts. Calculation of operating ratios (Railroad Operating Expenses/Railroad Operating Revenue) for the applicants' railroads ATSF, SPT and SPT Subsidiary companies from 1983 to 1985 condensed from financial information presented by the applicants is shown in Table 6.

Table 6[62]
Comparisons of Operating Ratios

	Operating Ratios %		
Railroad	1983	1984	1985
SPT	101.43	99.29	100.51
SPT Consolidated	99.80	98.07	99.41
ATSF	91.26	90.36	92.76
Industry Average*	**90.91**	**87.60**	**91.44**

*Class 1 Line Haul Railroads

The I.C.C. also noted that the SPT had positive Net Railway Operating Income (NROI) in each of the three years and that NROI for 1985 was 16 million greater than that in 1983 when the SPT was characterized by its officers as healthy.[63] The I.C.C. did, however, concede that the SPT is a marginal carrier compared to the rest of the industry on the basis of its operating ratio.[64] The I.C.C. majority also agreed that the SPT and ATSF were revenue inadequate railroads as were all other major railroads, but that conclusion in no way provided sufficient justification for approving a merger. The I.C.C. concluded that Congress's intent in passing the Staggers Act, limiting the

commission's ability to regulate rates, was premised on the encouragement of competition and market forces to ensure adequate revenues. "It is not an excuse for the elimination of competition."[65]

Chairman Gradison, in her rebuttal of the majority, while recognizing SPT's non-rail assets and income which may reduce the likelihood of bankruptcy in the near term, noted on this issue that the SPT's NROI is an after-tax figure. In the case of the SPT, she noted, large tax credits and credits for deferred taxes make the results better than the actual operating results.[66] In addition, Chairman Gradison noted the Supreme Court's interpretation of the Transportation Act of 1920, as intended to promote the merger of financially weak carriers by strong carriers, was relevant to this case.[67]

Conclusion

This paper has shown that with the economically correct definition of the market the evidence suggests that the social costs of this merger would outweigh the social benefits. The I.C.C.'s disallowal of the merger was appropriate. However, the reasoning of the I.C.C. leaves many issues unsettled and raises some question about future rail merger policy. With the market definition formulated by the I.C.C., the projected social benefits of the merger were greater than the social costs. Why would the I.C.C. reject such a merger? This apparent change in I.C.C. policy could be due to the complicated issue of trackage rights in this case, the question of the credibility of the applicant's case, and/or the impact of the Staggers Act.[68]

In previous horizontal mergers, the I.C.C. has attempted to offset anti-competitive effects through the imposition of conditions. In this case, the I.C.C. appears to have lacked consensus as to the nature and scope of conditions that might be imposed if they voted to allow the merger. This lack of consensus was most likely based in part on the fact that the applicants were strong in their opposition to any significant conditions to merger and provided little help in the modification or incorporation of conditions suggested by the UP, DRGW and KCS.

That the applicants were opposed to many of the traditional conditions such as trackage rights and independent rate making authority sought by rival carriers was clear in the testimony of one of their witnesses.

> The very fact that the Commission has granted imposed trackage rights has a chilling effect on the negotiation, and provides a motivation for prospective tenants to make non-compensating offers.[69]

In addition, the I.C.C., while not rejecting the evidence of the impact of those conditions suggested by the protestants (as described earlier), saw inherent contradictions in approving these conditions either in whole or in part. They rejected outright KCS's IRMA (Independent Rate Making Authority) proposal and found that the UP and DRGW conditions in and of themselves raised complicated issues regarding traffic flows, interlining and competitive access which the I.C.C. could not effectively quantify. Moreover, if both railroads conditions were imposed, they would potentially have such an adverse effect on the new system that it would compromise its chance of success, and in addition would amount to a major restructuring of western railroads which the I.C.C. was not prepared to do.[70]

> ...we have before us proposed conditions which, when viewed narrowly, appear to alleviate some of the anticompetitive problems, while continuing or creating others, and rearranging traffic patterns in ways that may have unforeseen consequences. [and]...in attempting to apply the conditions we risk diluting the traffic base for all competitors and jeopardizing the success of the merged system.[71]

There also seems to be an additional overriding concern which was not explicitly stated and yet appears in several places throughout the decision, a factor which we might broadly classify as the "credibility" of the applicants. Examples include: a) the screening process used by the applicants to minimize the amount of traffic that could be classed as captive traffic; b) the financial argument which contained contradictory testimony between the 1983 Justice Department proceeding on the merger of the holding companies and the 1985 testimony by the companies' officers on the "bankruptcy" of the SPT; and c) the internal memos that surfaced during the hearings (KCS-C-1) which seem to suggest that the Santa Fe intended to reduce intramodal competition and gain significant market power and Staggers Act benefits over and above any cost savings by affiliating with another major carrier.

Finally, this decision may reflect the impact of the Staggers Act and continued rail deregulation. In an environment where the role of regulation continues to diminish, it is possible that the I.C.C. will place greater reliance on maintaining competitive markets in order to achieve desirable performance.[72] This concern for competition could explain why this merger was prohibited despite the I.C.C.'s estimate of the social benefit exceeding the social costs.

Epilogue

Efforts by the Santa Fe Southern Pacific Corporation to have the merger proceedings reopened were formally denied by the I.C.C. on June 30, 1987. The company then filed its intention to divest itself of the SPT in September 1987 in accordance with the original I.C.C. decision that it divest itself of one or both railroads.[73] Both Kansas City Southern Industries, holding company for the Kansas Southern Railroad and Rio Grande Industries made bids for the railroad and on Dec. 24, 1987, the Rio Grande Industries bid for the SPT was accepted by the Santa Fe Southern Pacific Corporation.

The Railroad Control Application was filed on Feb. 22, 1988 and approved by the I.C.C. effective Oct. 12, 1988.[74] The acquisition was in essence a leveraged buy out by RGI reflecting the value of the SPT's significant real estate holdings.[75] Since that time the merged railroads, operating under the Southern Pacific name, have continued to lose money on railroad operations. The loss in 1989 was reported to be $66 million. These losses have in large part been offset by real estate sales.[76]

The merger of these two railroads did not present the same problems for the I.C.C. as that of the SPSF since the SPT and the Rio Grande were end to end carriers over the central corridor. Thus, the I.C.C. could see a reasonable alternative to the UP system in the central corridor. In its 4-0 vote, "the I.C.C. said it favored the RGI bid as providing 'substantial public benefits' without producing 'discernible harm to the competition or to essential railroad service.'"[77] In addition, the merged

system, by routing some traffic off the SPT's southern corridor would allow the firm to take advantage of its excess capacity on the central corridor and to reduce congestion on SPT's single track southern route.[78] Unfortunately, traffic levels on the system have been down since the merger and this routing option has not been heavily used. To date, the financial benefits of the merger have yet to be realized and it is certainly possible that, should this merger not prove successful, additional changes would be in store for the alignment of the western railroad map.

Notes

[1]Santa Fe Southern Pacific Corporation--Control-Southern Pacific Transportation Company, 2 I.C.C. 2d at 715.
[2]*Railway Age*, Vol. 187, No. 9, September 1986, p. 19.
[3]2 I.C.C. 2d at 758-759.
[4]The data for Table 1 are based on information shown in 2 I.C.C. 2d at pp. 767-771.
[5]The data for Table 2 are taken from 2 I.C.C. 2d at pp. 773-774.
[6]2 I.C.C. 2d at 744.
[7]2 I.C.C. 2d at 745.
[8]2 I.C.C. 2d at 746.
[9]2 I.C.C. 2d at 747.
[10]366 I.C.C. at 504.
[11]The data for Table 2 are taken from 2 I.C.C. 2d at 765.
[12]2 I.C.C. 2d at 766.
[13]2 I.C.C. 2d at 795.
[14]2 I.C.C. 2d at 795-6.
[15]49 United States Code 11345.
[16]2 I.C.C. 2d at 739.
[17]2 I.C.C. 2d at 741.
[18]2 I.C.C. 2d at 751.
[19]2 I.C.C. 2d at 750.
[20]2 I.C.C. 2d at 874-5.
[21]2 I.C.C. 2d at at 748.
[22]2 I.C.C. 2d at 749.
[23]2 I.C.C. 2d at 749.
[24]2 I.C.C. 2d at 749.
[25]2 I.C.C. 2d at 744.
[26]2 I.C.C. 2d at 744.
[27]2 I.C.C. 2d at 745.
[28]2 I.C.C. 2d at 745.
[29]2 I.C.C. 2d at 745.
[30]2 I.C.C. 2d at 746.
[31]2 I.C.C. 2d at 746.
[32]2 I.C.C. 2d at 503-504.
[33]2 I.C.C. 2d at 876.
[34]For a discussion by several authorities on the issue of horizontal mergers and the 1982 Department of Justice Guidelines see, *The Journal of Economic Perspectives*, Fall 1987, pp. 3-54.
[35]To demonstrate the notion of source competition, assume that some commodity X is shipped by rail from point A to point B. The shipment of commodity X to point B from points other than A represents source competition.
[36]Russell Pittman, "Railroads and Competition: Why the Santa Fe/Southern Pacific Meger had to Die," Department of Justice Economic Analysis Group Discussion Paper No. 88-10, Aug. 26, 1988.
[37]Pittman notes empirical evidence that finds significant post merger rail rate increases when the number of railroads declines from three to two or from two to one. See R. C. Levin, "Railroad Regulation, Deregulation, and Workable Competition." *American Economic Review Papers and Proceedings*, Vol. 71 (1981a), pp. 394-398; R. C. Levin, "Railroad Rates, Profitability, and Welfare Under Deregulation." *Bell Journal of Economics*, Vol. 12 (1981b), pp. 1-26; C. M. Grimm, "Horizontal Competitive Effects in Railroad Mergers." *Research in Transportation Economics*, Vol. 2 (1985), pp. 27-53; J. M. MacDonald, "Competition and Rail Rates for the Shipment of Corn, Soybeans, and Wheat." *Rand Journal of Economics*, Vol. 18 (1987), pp. 151-163.
[38]Pittman, p. 17.
[39]Pittman, p. 19.
[40]Pittman, p. 20.
[41]2 I.C.C. 2d at 913 and 918. The combined 1984 railroad operating revenue for the ATSF and the SPT was $4,954,504,000.
[42]2 I.C.C. 2d at 875; Pittman, p. 17, 20.
[43]Merger Symposium, *Journal of Economic Perspectives*, Fall 1987, pp. 3-54.
[44]2 I.C.C. 2d at 873.
[45]2 I.C.C. 2d at 873. The traffic diversion benefits figure of $56.3 million was obtained by the applicants by performing studies intending to show that the rail traffic diversions resulting from the merger would reduce all railroads' variable costs by that amount.
[46]2 I.C.C. 2d at 875.
[47]2 I.C.C. 2d at 875.
[48]2 I.C.C. 2d at 876.
[49]2 I.C.C. 2d at 876.
[50]William P. Barrett, "Working Over the Railroad." *Forbes*, Vol. 142 No. 10, Oct. 31, 1988, p. 51.
[51]2 I.C.C. 2d at 788.
[52]Under the CP conditions, established in 1923 with the merger of the Central Pacific and the Southern Pacific, the SP was prevented from diverting traffic from the Central to the Southern Corridor at the expense of the CP. Condition 'e' required the SP to continue to actively solicit traffic to be moved through the Central Corridor. The DRGW joined the UP as a beneficiary of the CP conditions when they were extended to the DRGW in 1966. With the UP/MP/WP merger, the UP lost its incentive to interline with the DRGW. In order to preserve competition in the Central Corridor, trackage rights were granted to the SPT and to the DRGW. Also, the SPT and DRGW entered into a solicitation agreement to influence traffic over the SPT and DRGW using the Ogden Gateway. With the SPSF merger, the DRGW would lose its last "friendly" connection in the Central Corridor. Termination of the CP conditions and solicitation agreement would threaten DRGW economic viability.
[53]*Trains*, August 1984, Vol. 44 No. 10, p. 4, 6.
[54]2 I.C.C. 2d at 828.
[55]2 I.C.C. 2d at 831.
[56]SFSP Opening Brief at 48 cited on p. 832.
[57]SFSP Opening Brief at 94 cited on p. 833.
[58]2 I.C.C. 2d at 829.
[59]2 I.C.C. 2d at 829.
[60]2 I.C.C. 2d at 829.
[61]2 I.C.C. 2d at 830.
[62]Industry average computations are taken from data in the AAR Handbook, 1984 and 1985. Operating ratios for Applicant Railroads are taken from 2 I.C.C. 2d at pp. 913-918.
[63]2 I.C.C. 2d at 911.
[64]2 I.C.C. 2d at 911.
[65]2 I.C.C. 2d at 833.
[66]2 I.C.C. 2d at 850.
[67]2 I.C.C. 2d at 851.
[68]The SPSF merger can be viewed as the first major case which fell entirely within the time period after passage of the Staggers Act. There was, however, another horizontal merger case on which the I.C.C. ruled prior to the SPSF merger. In March 1984, the Reorganization Court in charge of the bankruptcy of the Chicago Milwaukee St. Paul and Pacific Railroad (filed on Dec. 19, 1977) referred all applications to acquire this bankrupt railroad to the I.C.C. for review. In January 1985, the I.C.C. approved two acquisition proposals, one from the Chicago and Northwestern Railroad and one from the Soo Line Railroad. While both proposals represent horizontal mergers, only the C&NW proposal incorporated significant trackage rights concessions to the Soo Line, conditions imposed by the I.C.C., which the C&NW Railroad accepted. In spite of these conditions, however, the I.C.C. expressed a preference for the Soo Line proposal and in February, the Reorganization Court ruled in favor of the Soo proposall. Later that month the CMSP&P was sold to the Soo Line.
[69]See Baumol testimony, FD 30400, p. 10,077.
[70]2 I.C.C. 2d at 826.
[71]2 I.C.C. 2d at 827.
[72]This philosophy was mentioned in UP Control. See, 366 I.C.C. at 502.
[73]2 I.C.C. 2d at 852.
[74]Gus Welty, "SP and DRGW: A Good Fit." *Railway Age*, Vol. 189, No. 10, October 1988 p. 28-29.
[75]Barrett, p. 51.
[76]*Wall Street Journal*, June 8, 1990, p. A5E.
[77]Welty, p. 29.
[78]Welty, p. 31.

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Local Subsidies for Industrialization: An Empirical Application

*by Bobby E. Apostolakis**

Prologue

Persistent regional unemployment has been a serious threat to the growth of the overall United States prosperity. The typical objectives of a regional policy for depressed areas are to accelerate their economic growth or to arrest their decline and reduce their above-average rate of unemployment and underemployment. In general, a regional economic policy presents four pillars: objectives, strategies, instruments, and evaluation. Therefore, the success of regional policies is the harmonious growth of economic indices manifested by the decreased income disparity between regions and the decline in the entropy index.

To achieve the aforementioned objectives, local governments and private-interest groups in the afflicted regions design strategies to induce out of state industry to relocate in their area. Although this is primarily a European phenomenon, many localities in the U.S. have offered assistance to industry of one form or another despite the apparent transatlantic differences in central control and tax laws.

Convinced that industrial development is the answer to regional unemployment, local authorities and development organizations offer incentives in the form of loans of small or no interest, tax exemptions, cash outlays, free sites for construction, and free buildings. Hence, financial assistance rendered to industry by localities to alleviate unemployment varies from subsidies of little cost to those of relatively high cost. Decision makers regard the expansion of the local industrial base and its side effects as the panacea of all fiscal ills.

Industrial subsidization has been extensively practiced but also condemned widely by economists. The approach has been rejected as an unwarranted interference with the efficiency of resource allocation, as a technique which discriminates against already established firms in a region, and a method which yields a zero sum since no benefits accrue at the federal level when localities are caught competing against each other to attract industry canceling out the subsidy effect.

The remainder of this paper is organized as follows: Section 2 describes Arkansas' economic characteristics and the applied measures for its development. It will be apparent that finite and concrete steps to attract industry in Arkansas are sporadic. In Section 3 I explain my proposal of plant financing, relate the subject with the elasticity of supply of Arkansas' work force, and review the relevant literature. This proposal is studied in conjunction with a shift-share analysis (Section 4) and a regression exercise (Section 5). The conclusion in Section 6 offers two arithmetic expressions in an Appendix.

Arkansas: The Economy and Industrial Subsidies

This section reviews the economic characteristics of Arkansas since the early 1950s, the relevant problems preventing the economic development of this state and the legislation enacted for the attraction of industry.

Arkansas had in 1950 a population of 1,906,000 (Table 1).[1] Arkansas' population declined by 6.2 percent until 1959, but increased by 7.09 percent and 13.34 percent during the 1960's and 1970's, respectively. Throughout the 1950-86 period, Arkansas' population has been less than 1 percent of the nation's. The total income of the state has increased faster during the 1970's and 1980's, but still ranks 50th in the nation. The per capita income ranks 49th in the nation During the 1950's, the U.S. per capita income was almost twice that of Arkansas; this gap became closer during 1970-86.[2]

Since the early 1950's, the number of farm dwellers in Arkansas has been established. The state also has attracted a respectable amount of light industry and has developed some indigenous business, a few of which are national leaders in their fields. Still, Arkansas ranks at the bottom of manufacturing employment and production. As a result, industrial investment in the state has been very small on a nationwide basis (e.g., 0.11 percent in 1954 and 1.73 percent in 1982).

Recommendations and laws providing incentives for industrialization in Arkansas exist in plethora. The Arkansas Economic Development Commission (1976) suggested that the state should develop: a) risk capital sources to expand Arkansas business; b) an action program with its financial community emphasizing the role of commercial banks in the formation, attraction, growth, and effective operation of new and recently established companies; and c) a favorable business climate for investment in order to protect private capital inflow and prevents its outflow.

Senate Bill 551 (State of Arkansas, 1985) offered tax credits to manufacturing firms for their modernization of plants and equipment, for expanding rather than divesting Arkansas operations, and for creating new jobs. To qualify, a manufacturer must: 1) have been in continuous operation for at least

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Table 1

Comparative Statistics for Arkansas (AR) and the U.S.
(Randomly Selected Estimates, 1950-86)[1]

	Population			Income			Income/Capita			Mfg.Employment			Mfg. Investment		
Year	AR	U.S.	%[2]	AR	U.S.	%	AR	U.S.	%	AR	U.S.	%	AR	U.S.	%
1950	1,906	151,684	1.26	1.58	207.5	0.76	825	1,368	60.31	73	15,241	0.48	28	7,491	0.37
1958	1,773	174,141	1.02	2.17	324.9	0.67	1,228	1,865	65.84	89	15,945	0.56	58	11,433	0.42
1962	1,874	186,590	1.00	2.74	396.2	0.69	1,504	2,123	70.84	117	16,853	0.69	75	14,900	0.50
1969	1,990	202,736	0.98	4.89	656.7	0.74	2,556	3,239	78.91	161	20,167	0.80	181	31,689	0.57
1973	2,031	211,939	0.96	8.10	949.8	0.85	3,956	4,481	88.28	200	20,154	0.99	232	38,010	0.61
1978	2,167	222,629	0.97	13.67	1,551.2	0.88	6,098	6,968	87.51	218	20,505	1.06	519	67,620	0.77
1982	2,308	232,549	0.99	19.41	2,261.4	0.86	8,424	9,724	86.63	195	18,781	1.04	701	120,700	0.58
1986	2,371	241,650	0.98	26.30	3,019.6	0.87	9,705	12,496	77.66	193	18,965	1.02	826	142,700	0.58
1950 - 59[3]	-6.20	17.50		36.18	69.72		60.85	42.25		34.38	12.81		223.9	14.92	
1960 - 69	7.09	12.41		105.61	90.14		91.57	63.09		45.53	19.52		139.9	57.50	
1970 - 79	13.34	9.84		181.44	156.23		143.24	120.18		32.00	9.40		138.6	50.77	
1980 - 86	3.74	6.41		51.42	55.98		116.07	48.39		1.03	-6.51		44.46	26.35	

[1]population and manufacturing (mfg) employment are in thousands; mfg. investment are in millions; and income is in billions of current dollars.
[2]percent Arkansas vs U.S.
[3]percentage changes during decades.

two years prior to applying for such tax credits; 2) expend at least five million dollars on eligible items; and 3) address total costs, construction period, contractors (local contractors should be preferred), announce employment increases, and describe the product or service to be provided.

Upon approval of eligibility, the manufacturer must certify the amount of expenditures on the project during the preceding year and receive credit of seven percent of such expenditures. This credit shall then be applied against the manufacturer's state sales and use tax liability in the following year or until such credit is exhausted.

The Winthrop Rockefeller Foundation (1982) report identified twelve obstacles to economic development in Arkansas. The poor economic showing of the state was attributed to the lack of job skills and limited capital endowments. This report promoted the idea of forming a joint public-private venture capital organization on a large enough scale to attract new enterprise to Arkansas. Public funds would come from pension funds and, in return, the pension funds would receive preferred stock in the new firm. Private funds would be raised from individual investors on a common stock basis.

The report of the Arkansas Economic Expansion Commission (1964) stated that, until the mid-1960's, there had been little or no real attempt to purposely favor local investment opportunities. It recommended: a) more deliberate efforts to support local investment opportunities; b) a task force of specialists to provide aid to new industry; and c) offering of some sort of premiums for reinvesting profits locally. Similarly, the objectives of the Industrial Development Organization and the Development Finance Corporation were to accumulate capital for loans not usually offered by banks, namely long-term semi-equity loans. Arkansas communities were allowed to issue bonds whose payments were guaranteed by a local tax.

Obviously, one of the major difficulties for the economic growth in Arkansas is the financing of projects. Banks and other financial institutions are restricted to create statewide branches; thus, their ability to loan is limited. Moreover, precious capital so desperately needed by Arkansas is systematically shipped out of state. Managers of pensions funds (the largest pool of capital in the state) favor large blue-chip companies and safe government securities instead of small companies in Arkansas. According to a Winthrop Rockefeller Foundation report (1982), however, these small companies are no riskier than the larger blue-chip companies and have yielded higher rates of returns during the last 15 years.

Regional Subsidies and 100 Percent Plant Financing

This section proposes a regional subsidy plan as a new policy to increase employment and income in poverty pockets of Arkansas. State municipalities in cooperation with development groups shall finance the total acquisition of plant sites and necessary construction for manufacturing firms willing to expand, relocate, or establish within Arkansas.[3] This financing requires the raising of sufficient funds through donations and primarily borrowing in order to supply industrial-aid bonds. These bonds are traditionally offered to merchants, banks, contractors, farmers, and the general public.

Indeed, local governments in Arkansas may use their borrowing powers. Most of the debt of state and local governments is secured by the full faith and credit of the issuing unit.[4] When the debt is incurred, a percentage of the issue will come due every year. For example, the annual service charge for a 30-year issue will include the payment of one-thirtieth of the principal and the required interest.

Since WWII, nonguaranteed bonds have been used extensively in the U.S. to aid private industry; in over 40 states, local governments have been authorized to issue revenue bonds in order to acquire land, buildings, and equipment that are leased to private firms. The issuance of such debts may be approved by referendum with the debt ceiling being equal to a percentage of, say, the property tax base of a locality in Arkansas. Maxwell and Aronson (1977, p. 209) state that "strictly defined, revenue bonds are those for which interest and principal are payable exclusively from the earnings of a specific enterprise."

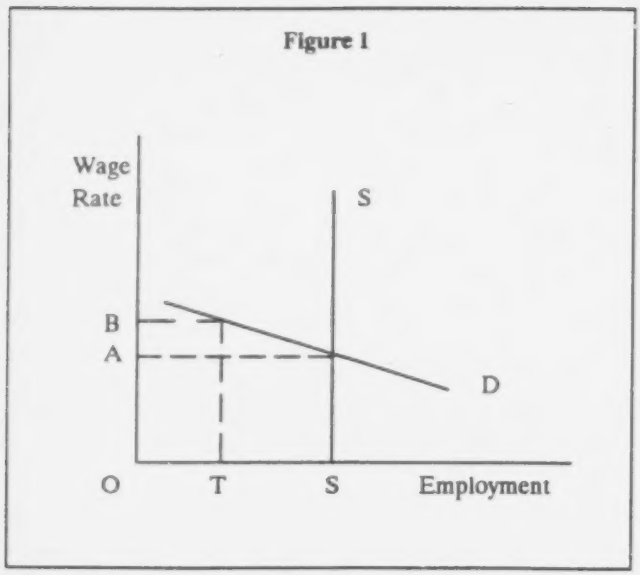
Arkansas municipalities issuing revenue bonds to finance an industrial project may incur no legal obligation to pay interest or redeem the debt out of its own resources. Such bonds will be secured through the earnings of the firm occupying the facility and the market will judge the bond issue on the basis of the credit quality of the firm. Nonguaranteed bonds will enable recipient firms to derive a cot advantage over other private firms and induce firms to relocate when market forces themselves fail to induce such relocation.[5]

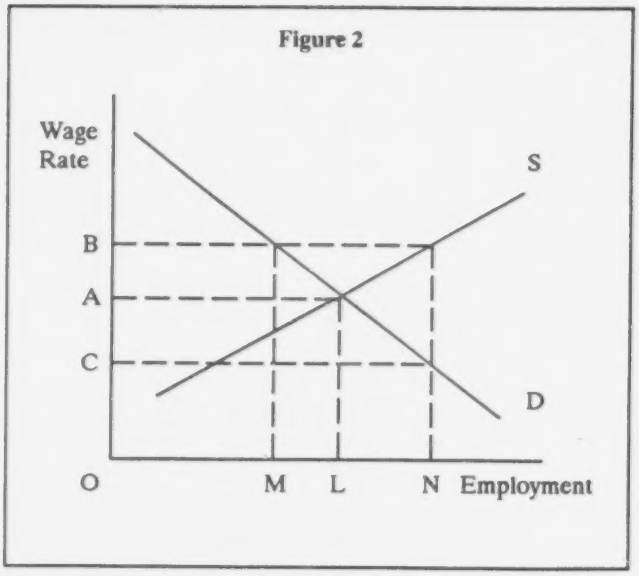
Once the plant is built, it is leased to the subsidized firm for a specified period during which lease payments are installed sufficient to cover interest and amortization cost of the raised funds. The plant shall be build according to the specifications of the firm; the value of the financed plant may be estimated by private sources of credit. The rate of return on the 100% plant financing may be calculated by placing the perpetual annual value of the income benefits over the capitalized subsidy costs.[6] Once the lease is paid off, the plant becomes property of the tenant; therefore, the 100 percent plant financing is in effect a mortgage loan by the municipality for the full cost of the plant.

Capital formation will lead to greater labor demand which in turn will affect wages; the elasticity of labor supply is important:

a) If wages are flexible downward and Arkansas labor is insufficiently mobile, then local industrial subsidies will act as a substitute for freely flexible wage rates improving the allocation of resources. It is asserted that workers in the stagnant parts of the South are reluctant to move. In Figure 1 (p. 26), Arkansas labor OS is fully employed at wage OA. A federal minimum wage OB reduces employment to OT and yields unemployment equal to TS. A subsidy equal to AB will eliminate unemployment by reducing the firm's effective unit labor cost to OA which is the marginal revenue product at full employment.

b) Under labor mobility, the labor supply curve (S) is upward sloping. At full employment (OL) wages are OA (Figure 2). At federal minimum wage OB, employment drops





to OM forcing ML laborers to out-migrate. The difference between the minimum wage OB and the marginal revenue product OC (of labor force ON) requires a subsidy CB per unit of labor employed if labor is to be retained. Subsidies in this case exceed those required in the former case.

If capital is drawn to low-wage areas of Arkansas, unfavorable economic differentials are expected to be reduced gradually. The stimulation of local industries will ultimately accelerate employment, income, and taxable values. Plant subsidies reduce the cost of servicing capital and allow lower production costs which, in turn, yield a competitive advantage and increase the market share of the subsidized firm. In sum, it is expected that the multiple benefits will be reaped by laborers (higher income, improved health insurance), eligible firms (100 percent plant financing, immediate availability of facility), municipalities (local multipliers, agglomeration effects, etc.), and state governments (increased tax receipts, etc.).[7]

The critical question is whether costs surpass benefits and whether regional subsidies force a serial relocation of firms around states. Admittedly, localities will face hard questions regarding the reduction of negative externalities (e.g., pollution) and the controlling of additional costs of public service (e.g., schooling, police, etc.). Costs may be quantified by measuring waived taxes and the difference between the firm's bond issue yield and the industrial revenue bond yield. Although any quantification is improbable at the present stage of the proposal, we by-pass Blake's (1972) heroic hypothesis that regional subsidies bear zero opportunity costs.

Since the 100 percent plant financing is actually a regional capital subsidy, it is pertinent to review the relevant literature. It seems that subsidies for regional development have become almost a cliche. In the U.S. many states have enacted legislation to foster economic activity. Indeed, 45 states offer tax-free state and local revenue bond financing to industry; 29 states offer other types of low-interest loans; 25 states waive sales taxes on newly purchased equipment; and 38 states do not levy inventory taxes on goods in transit. As Weinstein and Firestine (1978, p. 134) claim, virtually all states have established industrial development agencies and many local governments offer tax credits, abatements, and rapid depreciation to encourage new investment in plant and equipment.[8]

The literature is affluent in analyses of regional capital subsidies.[9] Buchanan and Moes (1960) staunchly supported local subsidies to private industry in order to cure impediments to market adjustments and attract new firms. Moes's (1962) cost-benefit approach to measure the rate of return of regional subsidies was applied by Rinehart (1963). Swales (1981) claims that the sign of the change in employment (ΔL) depends solely on the elasticity of demand (η) for the produced commodity:

$$\Delta L \gtrless 0 \text{ as } \eta \gtrless 1.$$

Moore and Rhodes (1973, 1976), and Ashcroft and Taylor (1977) in seminal studies on the impact of British regional policy found rather spectacular results. According to the former, investment incentives for eight years generated 36 moves annually. The latter concluded that capital subsidies resulted in the relocation of about 500 firms into the distressed British periphery, 1961-71. Blake (1972) explained that industrial redistribution reduces inflationary trends in the labor market of prosperous regions. Blake's empirical results on employment generated by capital subsidies seem perverse and inconclusive.

Buck and Atkins (1976) recommend that capital subsidies should be reserved for industries with low elasticity of capital for labor substitution (σ_{KL}). If $\sigma_{KL} > 1$, a reduction in the price of capital via subsidies will induce a more than proportionate amount of labor displacement. Extensive research has been undertaken for the assessment of the British Industrial Development Certificates to attract capital into stagnant zones [e.g., Buck and Lowe (1972), Cameron and Clark (1966), Beacham and Osborn (1970)]. Interestingly, Buck and Lowe (1972) state that regional intervention may lie outside the field of economics.[10]

Shift-Share (S-S) Analysis

S-S in conjunction with the regression part of Section 5 may shed sufficient light into Arkansas economic structure and relate to the proposed 100 percent plant financing inquiry. While the basic formulation in S-S warrants a brief description, an application of S-S to Arkansas data seems pertinent. Major contributions with their strength and shortcomings are cited.

S-S as a mathematical standardized apparatus compares and identifies a regional with the national performance (usually in employment) during a time span. The regional employment growth is separated into *share* and *shift* components. The *national share* shows the employment change expected from the aggregate national growth rate. It measures the change in employment that would take place in a region if the economy had grown at the same rate as total employment in all regions considered.

The shift for any region is subdivided into two components: a) the *industrial mix*, and b) the *regional share*.[11] The shift component represents any deviation in regional employment growth from the national share.[12] It is positive in prosperous regions and negative in depressed regions. The industry mix shows the amount of regional employment growth attributable to the region's initial industry mix; it reflects a region's mix of fast- and slow-growing industries. Thus, a region that specialized in electronics a decade ago would be expected to have a rapid growth. Finally, the regional share growth in employment is due to the fact that a region's employment is increasing faster than the national.

Arithmetically, the classical S-S components for the *ith* industry are:

COMPONENT	FORMULA
Total Growth in *ith* Industry	$\Sigma = A_t^i - A_o^i$
Share	
National Share	$A_o \left(\frac{U_t}{U_o} - 1\right)$
Shift	
Industrial Mix	$A_o^i \left(\frac{U_t^i}{U_o^i} - \frac{U_t}{U_o}\right)$
Regional Share	$A_o^i \left(\frac{A_t^i}{A_o^i} - \frac{U_t^i}{U_o^i}\right)$

A_t^i = Arkansas employment in *ith* industry at terminal period.

A_o^i = Arkansas employment in *ith* industry at base period.

U_t = Aggregate U.S. employment at terminal period.

U_o = Aggregate U.S. employment at base period.

U_t^i = Aggregate U.S. employment in *ith* industry at terminal period.

U_o^i = Aggregate U.S. employment in *ith* industry at base period.

Example 1: Components of changes in manufacturing employment between 1976-1986 in Arkansas are (in thousands)

	COMPONENTS OF EMPLOYMENT CHANGE			
(1) Arkansas Employment Change	(2) National Share	(3) Industrial Mix	(4) Regional Share:	(4a) Index
3,586	1,853	148	1,585	1.59

Col. (1) Shows the actual change in employment.

Col. (2) Represents the employment growth that Arkansas would have experienced if its number of jobs had expanded at the national average rate. Where the actual change in employment (3,586) is greater than the national share (1,853), Arkansas' employment grew at a faster rate than the national average; it grew more than twice as fast as the national.

Col. (3) Reflects the advantage bestowed on Arkansas by virtue of its industrial makeup. Arkansas prospered in terms of the industry mix measure.

Col. (4) Reflects how Arkansas' manufacturing performed compared to the average for each industry. If Arkansas' industry grew at the same rate as that industry nationwide, then the index figure would be 1.

Col. (4a) An index greater than 1 represents better than average performance (e.g., 1.59 shows employment growth 59 percent above average).

Table 2
Employment (1,000) in Nonagricultural Establishments by Industry
U.S. and Arkansas, April 1953-April 1988

	U.S.				Arkansas			
	Employment		Change in Employment		Employment		Change in Employment	
Industry	1953	1988	Total	%	1953	1988	Total	%
Mining	844	739	-105	-12	6	4.2	-1.8	-30
Construction	2,644	5,240	2,596	98	18.6	33.8	15.2	82
Manufacturing	17,259	19,459	2,200	13	82.5	225.6	143.1	173
Transportation & Public Utility	4,224	5,542	1,318	31	30.4	51.2	20.8	68
Wholesale & Retail Trade	10,533	25,172	14,639	139	74.7	193.4	118.7	159
Finance, Insurance & Real Estate	2,025	6,649	4,624	228	8.8	37.7	28.9	328
Services	5,486	25,156	19,670	359	36.4	160.5	124.1	341
Government	6,645	17,312	10,667	161	57.4	151.8	94.4	164
Average Total Employment	49,660	105,269	55,609	120	314.8	858.2	543.4	173

Source: U.S. Department of Labor, *Employment and Earnings*; also, *Supplement to Employment and Earnings; States and Areas Data*.

Table 2 shows major nonagricultural industry group employment changes for the U.S. and Arkansas, 1953-1988; the total employment growth for the U.S. was 120 percent and for Arkansas 173 percent. Arkansas sustained employment losses in mining only and recorded marked gains in manufacturing, trade, finance, services, and government. Among the eight nonagricultural industries, three of them in Arkansas had growth rates below their national counterparts and five had growth rates above their national counterparts. Remarkable is the difference in the growth rates of manufacturing where Arkansas advanced markedly compared to the national growth in this sector (13 vs. 173 percent).

Table 3 shows employment developments of the manufacturing sector by group of durable and nondurable products for both the national and Arkansas level, 1953-88. Although the percentage changes in Arkansas appear impressive in comparison with those of the U.S., the total contribution of the state in the national manufacturing employment is minimal during the entire period.

We next apply S-S analysis for Arkansas. Column 3 (Table 4) represents a hypothetical growth in employment for the industries in accordance with the specification of Table 2, 1953-88. Arkansas' total nonagricultural employment would have increased by 377,700 if each industry had grown at the national 1953-88 growth rate of 120 percent. This number (377,700), compared with the actual employment growth of 543,400 (173 percent) in Arkansas, shows the state's strength in employment growth over the national average.

The industrial mix effect on employment is shown in Column 4, Table 4. The numbers were derived by multiplying Arkansas' 1953 employment for each industry by the difference between the 1953-88 national growth rate for the industry and the national overall growth rate of 120 percent, 1953-88. For example, the employment change due to industrial mix for services in Arkansas is equal to 36.4 x (359 percent - 120 percent) where 36.4 is the 1953 state employment in services, 359 percent is the positive U.S. change in employment in the same sector, and 120 percent is the overall national employment change, all numbers being derived from Table 2. The industrial mix yields mixed messages with respect to the proportion of Arkansas' nonagricultural employment which has been concentrated in industries that were nationally fast growing.

Column (5) of Table 4 presents the share of employment change attributable to Arkansas' share or the extent to which the state growth rate for an industry exceeded or fell short of the U.S. growth rate for the same industry. Overall, Arkansas' growth of 165,700 in employment reflects a favorable distribution of industry. Most industrial groups in Arkansas had growth rates above the corresponding national rates. It should be noted that all three effects together are responsible for the aggregate change in the state employment.

A brief analysis for the manufacturing sector is pertinent. From Table 2, it is concluded that Arkansas' change in manufacturing employment, 1953-88, was equal to 173 percent versus a national increase of only 13 percent. In the durable

Table 3
Employment in Manufacturing (1,000): U.S. and Arkansas, 1953-88*

Industry	U.S. 1953	U.S. 1988	U.S. %	Arkansas 1953	Arkansas 1988	Arkansas %
Durables	10,283.0	11,433.0	11	41.4	135.9	228
Ordnance & Accessories	239.7	---	---	0.7	0.9	29
Lumber & Wood Products	777.9	743.7	-4	21.8	16.5	-24
Furniture & Fixture	382.8	534.4	40	5.3	9.1	72
Stone, Clay, Glass	546.7	583.8	7	2.4	5.2	117
Primary Metal Goods	1,352.8	775.7	-43	3.0	18.4	513
Fabricated Metal Goods	1,156.1	1,439.2	24	1.9	19.2	911
Machinery (except Electric)	1,749.2	2,105.4	20	1.7	21.7	1,176
Electrical Machinery	1,242.8	2,108.4	70	2.7	30.6	1,033
Transport Equipment	2,005.0	2,044.8	2	0.2	7.9	3,850
Instruments	333.4	705.7	112	1.4	2.9	107
Miscellaneous	496.6	381.9	-23	0.3	3.5	1,067
Nondurables	7,026.0	8,026.0	14	41.1	89.7	118
Food & Kindred Goods	1,448.1	1,590.8	10	18.4	37.9	106
Tobacco Manufacturers	92.1	50.5	-45	0	0	0
Textile Goods	1,205.8	726.5	-40	2.0	3.1	78
Apparel Goods	1,224.6	1,190.8	-3	4.5	10.0	122
Paper & Allied Goods	524.3	684.0	30	4.1	8.6	110
Printing & Publishing	784.3	1,555.5	98	2.8	10.1	261
Chemical Products	811.9	1,052.7	30	2.6	5.2	100
Petroleum & Coal	259.5	164.1	-37	0.5	0.9	80
Rubber Goods	284.0	965.6	205	2.6	8.6	231
Leather Goods	391.8	145.1	-63	3.6	5.3	47
Total	17,309.0	19,459.0	12	82.5	225.6	173

*All estimates are for April; annual observations, 1953-88, are available on request.

Table 4
Shift-Share Analysis of Employment (1,000) by Industry: U.S.-Arkansas, 1953-88

Industry	U.S. Employment changes due to: National Growth (1)	U.S. Industrial Mix (2)	Arkansas Employment changes due to: National Growth (3)	Arkansas Industrial Mix (4)	Arkansas State Share (5)	Changes in employment Total (6)	Changes in employment % (7)
Mining	257	-362	-7.2	-7.9	13.3	-1.8[‡]	-30
Construction	894	1,702	22.3	-4.1	-3.0	15.2	82
Manufacturing	729	1,461	99.0	-88.3	132.4	143.1	173
Durables	436	714*	49.7	44.7	0.1	94.5	228
Nondurables	408	592	49.3	-0.8	0.1	48.6	118
Transportation & Public Utility	299	1,019	36.5	-27.1	11.4	20.8	68
Wholesale & Retail Trade	3,846	10,793	89.6	14.2	14.9	118.7	159
Finance, Insurance, & Real Estate	612	4,012	10.6	9.5	8.8	28.9	328
Services	4,630	15,040	43.7	87.0	-6.6	124.1	341
Government	1,552	9,115	68.9	23.5	2.0	94.4	164
TOTAL	55,609	0	377.7	0	165.7	543.4	173

*Durable manufacturing: 436 + 714 = 1,150. This is the difference of 11,433 - 10,283 (from Table 3) in employment between 1953-1988. In other words, the employment changes in this sector is due to national growth (436,000) and industrial mix (714,000) employees. The same process is followed for nondurable manufacturing.
[‡]Columns (6) and (7) are transferred from the last two columns of Table 2. The corresponding figures for durable and nondurable manufactures are taken from Table 3.

subsector, the corresponding increases were 228 percent to 11 percent and in the nondurables subsector, the percentage changes were 118 for Arkansas and 14 for the U.S., respectively (Table 3). Both relative and absolute increases in state and national level favor Arkansas' manufacturing. Only the Lumber and Wood products industry sustained employment losses during 1953-88. Arkansas did surpass U.S. growth in manufacturing employment, and this may be an encouraging message to local and state decision-makers for the further industrial acceleration of the state. The endorsement of plant subsidies should then be considered as one of the instruments to be utilized for the strengthening of the state's manufacturing industry.

S-S was first used by Creamer (1943) and expounded by Dunn (1960); since then, S-S has been extensively used in regional economics internationally. Several authors have praised S-S; others have criticized it. The pros and cons have been argued extensively but will not be presented here in detail.[13]

Regression Analysis

In conjunction with the 100 percent plant financing and the S-S analysis, we present in this section relevant regression results. The main objective is to explore the effect of subsidies (S) on Arkansas manufacturing employment (AME), 1953-88. We select those subsidies which are exclusively granted to manufacturing by the federal, state, and local governments on an annual basis. It is expected that if past subsidies have positively contributed to state employment and income, the same trend will continue and even accelerate under our scheme of business subsidization. The presently proposed subsidy differs from previous motives since most of them, according to our tentative assessment (Arkansas, *Statistical Abstract*), rely on taxes.

We, also, assess the effect of two additional independent variables on AME, which is treated as the dependent variable throughout this exercise. The first is the Arkansas public investment (I) for infrastructure, which includes manufacturing. The second is the Arkansas civilian work force (L) which is a very important factor. Indeed, both the public and private sectors compete in the finding of advanced employees; given that poorly-trained, low-wage blue-collar workers are in plethora, high-tech firms become skeptical in their plans to relocate to South. The criteria of selecting S, I, and L as explanatory variables are two: (1) they are related to manufacturing employment in the state, and (2) all three are statistically significant when regressed on AME.

In order to obtain stronger assessment, linear, log-linear, and log-lagged regression specifications on annual (1953-88) deflated time series data of Arkansas are utilized (Table 5).[14] We produce six equations to study the behavioral relationship between the regressand AME and the regressors S (and S_{-1}), I, and L. Overall, the chosen regressions sufficiently explain most of the variance in each equation; indeed, the coefficients of determination R^2 are in the .90s, yielding satisfactory goodness of fit for the utilized data. Secondly, the parameters are statistically significant and carry the right sign. Third, with just one exemption, serial-correlation is absent, implying no loss of efficiency and lack of bias of the estimated standard errors; five equations yield Durbin-Watson (D.W.) values between 1.77

Table 5
Regression Equations for
Arkansas Manufacturing Employment (AME), 1953-88

	Constant	S	S_{-1}	I	L	R^2	D.W.
			Linear				
(1)	42.56 (13.79)[t]	.009 (6.85)		.005 (17.26)		.92	1.84
(2)	-18.75 (-6.97)	.011 (8.90)			.33 (15.66)	.89	1.77
			Logarithmic				
(3)	22.41 (4.75)	.44 (12.30)		-18 (4.70)		.94	1.88
(4)	11.36 (7.91)	.52 (8.47)			.76 (12.30)	.92	1.93
			Log-Lagged				
(5)	-12.31 (-1.06)*		0.21 (19.48)	.09 (7.74)		.90	1.82
(6)	4.43 (12.51)		.026 (20.38)		.80 (13.25)	.91	1.84

[t]t-statistics; *insignificant values at = 5 percent

and 1.93.

More specifically, the coefficients of S and S-1 are positive and statistically significant at = 5% in each specification. This attests to the important role of enacted subsidies in Arkansas employment. This is very encouraging for our proposal in addition to the advantagious regional share (Section 4). In regression 2 (Table 5), for instance, an increase in S by $1 million stimulates Arkansas manufacturing employment (AME) by .011, *ceteris paribus*. The logarithmic regressions yield markedly higher estimates of subsidy parameters which are also statistically significant.

State infrastructure (I) is also important for Arkansas employment; comparatively, though, subsidies have been more influential to employment than state investment. Nevertheless, all coefficients of I are positive and significant. In equation (1), an increase in (I) by $1 million will stimulate employment by .005 which falls short of the subsidy effect on AME (.009). The labor availability (L) is positively related with state employment; here, one may identify the shortcomings of quantitative techniques which ignore, as presently, the qualitative problems of Arkansas' labor.

The lagged equations present a fair explanatory power. The estimated values of the one-period lagged subsidies are positive, significant, and slightly more than twice as large as the current subsidies (equations 1 and 2), respectively. As a result, policy prescriptions based on a lagged subsidization function may differ from those based on the unlagged function. In equation (5), the constant term is not significantly different from zero at a 95 percent confidence level. Finally, in equation (6), serial correlation was detected but corrected with Cochrane-Orcutt and Hildreth-Lu iterative techniques which yielded unbiased and efficient parameter coefficients.

Since the regional share in Arkansas is strong (Table 4) and subsidies affect employment positively, the proposed 100 percent plant financing seems warranted. A very serious issue deserves marked emphasis at this stage. Arkansas suffers from lack of quality education; according to the Rockefeller (1982) report, state higher education receives a D as a grade. It would be ironic and tragic for Arkansas to offer expensive subsidies for the attraction of physical capital and fail to supply indigenous technocrats and business decision makers. Arkansas' work force needs to be highly trained since at this stage, we are convinced, the state requires the "import" of both types of capital; moreover, the inflow of human capital seems more difficult than the inflow of machinery and equipment.

Many issues could be derived in this scenario on human capital. For example, the income redistribution theme is of paramount importance; unquestionably, manufacturers will be benefited versus others. Since space prevents us from a thorough discussion on this fundamental topic, we declare that since growth is concentrated in the modern sector where incomes are higher, the majority of qualified employees will "fly" out of Arkansas to regions promoting and awarding human capital. Hence, the 100 percent financing proposal cannot succeed itself without a simultaneous upgrading of labor and management.

Epilogue

This paper is developed in a triangular framework: a) the proposed 100 percent plant financing, which is an explicit subsidy to attract industry in Arkansas; b) a shift-share analysis for Arkansas to indicate whether the industrial mix and Arkansas' share are advantageous in manufacturing employment in comparison with the nation's growth; and c) a regression analysis which is based on Arkansas time-series data, 1953-88.

The present conclusions are encouraging for the manufacturing employment of Arkansas due to two findings: i) the regional (Arkansas) share is sound, and ii) past subsidies have positively contributed to Arkansas' manufacturing employment. Hence, the 100 percent plant financing may become an effective instrument to direct industry into this region and revitalize stagnant areas.

The eclectic choice of a firm's location is a complex process with prominent intangible factors. It would, however, be a serious mistake for Arkansas policymakers to conclude that, since a part of investment cannot be readily explained, there is nothing they can or should do to foster development. It is recommended that prime concern should be shown to education promptly. Arkansas is not irreparably handicapped and decision makers should encourage development groups and municipalities to promote strategies suited to their needs and endowments.

A note of caution is pertinent. To quantify and assess each repercussion of investment subsidies is like a labyrinth. As a first attempt, our results should be considered robust and treated as suggestive rather than definitive. Nevertheless, they may instigate further research and warrant some euphoria to local authorities.

Abstract

I. To determine the annual rate of return of a capital subsidy (g), in a cost-benefit analysis, annual benefits are divided by the present value of investment:

$$\gamma = \frac{\mu\,[(\theta - \lambda) - S_a] + S_a}{S_c} .100$$

where:

- μ = the local multiplier
- θ = the annual payroll
- λ = the foregone income as workers vacate lower paying occuations in exchange for higher paying jobs in the subsidized plant, and
- S_a, S_c = the annual and capitalized values of the subsidy, respectively

The numerator expresses the annual income gain owing to the subsidy. The multiplication of the ratio by 100 yields the annual rate of return on the capitalized value of the subsidy in percentage terms.

II. To illustrate the value of plant financing in terms of savings in plant costs, assume that half of the required funds are

provided by the community development group at an interest rate of 8 percent per annum for 20 years. The remaining half of the plant cost is financed by a first mortgage loan through commercial channels. Let:

C = present cost of land, improvements, and plant construction.

$\bar{R}$ = monthly payment required for interest and amortization charges on funds borrowed at 8% per annum computed monthly.

R = monthly payment required if funds were borrowed from other sources in lieu of community group funds.

r = interest rate a firm would have to pay for a 20-year loan if state and community group development funds had not been available.

Then:

$$\frac{C}{2}=\sum_{j=1}^{240} R\left(1+\frac{r}{12}\right)^{-240}=R\left[\frac{1-\left(1+\frac{r}{12}\right)^{-240}}{\frac{r}{12}}\right]=R\beta \qquad (1)$$

where $\beta=[.]$ of equation (1). In the case of $\bar{R}$:

$$\frac{C}{2}=\bar{R}\delta \qquad (2)$$

where δ is the corresponding [.] of equation (2). Obviously, at r = 8%, r/12 = 0.0067.

The firm's savings (π) owing to plant financing are:

$$\pi=\frac{\left(1-\frac{\alpha}{\beta}\right)}{2}.100 \qquad (3)$$

Notice that as π rises, δ approaches zero. In equation (3), as δ approaches zero, π reaches 50%. If a firm had not been able to secure even first mortgage financing from commercial credit sources, the value of 100 percent financing would cover the total cost of the plant.

Notes

[1]Complete annual documentation and sources of the data are available upon request by the author.

[2]Malizia (1978) in a list of the earnings gap for 48 states, ranks Arkansas 47th. Strikingly, Arkansas' manufacturing yields a high profit rate, about 5.8 percent higher than the national average. Weinstein and Firestine (1978) rank Arkansas 8th in state business climate.

[3]Thorow (1980) asserts that investment decisions have become too important to be left to the private market alone. In essence, he encourages (i) a transaction from declining to growth industries, and (ii) the socialization of risk by industrial changes to all citizens.

[4]According to Maxwell and Aronson (1977), 40 percent of such debts in the U.S. is nonguaranteed and the three groups that hold the bulk of these securities are commercial banks, insurance companies, and private individuals.

[5]The proposed incentive of 100 percent financing of firms relocating in Arkansas will not generate a mega-free-rider problem. Such firms will face scarcity in labor skills and managerial talents, difficulties in the poor transportation system of Arkansas, and other relevant bottlenecks.

[6]Rinehart (1963) computed the present value of all future net increments to local payroll income resulting from subsidized plants. His rate of return on municipal subsidies to industry is the ratio of this present value of the multiplied net incremental payroll to the present value of the subsidy cost.

[7]Cumberland and Van Beek (1967) mention that the American Federation of Labor identified industrial subsidies as a main force for the postwar migration of Northern industry, for the substandard labor compensation, the low unemployment benefits, and the poor working conditions, thereby reducing the overall labor welfare of the South.

[8]Regional policies and incentives by type in the EEC countries (e.g., local and municipal tax concessions, capital grants, development grants, etc.) are analyzed by Yuill *et al.* (1980). A survey and critique of the importance of regional policies in Europe is done by Ashcroft (1982). This author (Apostolakis, 1987a, b) has studied federal and state fiscal incentives to foster economic development in Greece.

[9]Prominent is the work by Vanhove and Klaassen (1987).

[10]Regional subsidy schemes have been proposed by Reily (1965)(and Stober and Falk (1969) on industrial development bonds. Hale (1969) dealt with the optimality of local subsidies, Galper and Peterson (1971) with policies to support local borrowing, Smith (1968) with the response of municipalities to federal grants, Oakland (1979) with the assessment of regional policy impacts, and Cumberland and Van Beek (1967) investigated the direct effects of industrial subsidies on employment.

[11]Many synonyms have been used in S-S analysis. For national share: total shift, total differential, net relative change, absorptive differential. For industrial mix: composition shift, proportional shift, structural disadvantage, structural effect. For regional share: competitive shift competitive component, differential shift, growth deficit, regional effect.

[12]A referee has cautioned us on the use of regional share for competitive advantage implications. Attention should be paid to positive national industrial and regional shares.

[13]Houston (1967), Brown (1969), Buck (1970), and Herzog and Olsen (1977) doubt the logic, usefulness, and ability of S-S to predict and describe regional economic growth. Other authors [Ashby (1968), Stilwell (1970), James and Hughes (1973), Hellman (1976), Ireland and Moomaw (1980-81), Andrikopoulos (1977), Fothergill and Gudgin (1979), Kalbacher (1979), Chalmers and Beckhelm (1976), and Vanhove and Klaassen (1987)] challenged the contention that S-S is not a useful technique in regional economics, assessed S-S as a valuable method on both theoretical and empirical grounds, and reached constructive conclusions for various regions.

[14]Data documentation is available upon request.

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Issues in Transit Analysis: Evidence from a Cost-Benefit Study of the Utah Transit Authority

*by Jeffrey Waddoups**

Introduction

An important issue currently facing citizens and decision-makers in Southern Nevada is the need for and the viability of an extended system of bus mass transit. Others in similar-sized communities in the western U.S. have previously addressed, and also continue to address similar concerns in their own communities. For example, a cost-benefit study was recently conducted to determine the economic impact of the Utah Transit Authority (UTA), which serves Salt Lake City and surrounding areas (Fjeldsted, Mangum and Waddoups, 1987, 1988). Based on results drawn from this UTA study and a review of literature surrounding the economic analysis of transit systems, conclusions are drawn in this paper which may provide new insights for decision-makers and analysts to guide their thinking about specific problems arising in the context of transit analysis.

This paper is not designed to guide analysts in the specifics of transit analysis, rather it is an attempt to bring to light various issues that arise while attempting to determine the impact of an existing transit system, or the potential impact of a future transit system.

Traditional Cost-Benefit Analysis and Alternatives

The traditional method used to determine the benefits accruing from a public investment project, such as a transit system, is cost-benefit analysis. Under the standard assumptions of economic analysis, goods and services produced are appropriable in the sense that the benefits of consuming or producing will accrue directly to the consumer or the producer. In this case the market price will tend to reflect the benefit that will be received by those willing and able to purchase the good or service.

Public goods (in this case positive externalities are considered public goods), on the other hand, are not appropriable in this sense. Because the individual cannot adjust his or her consumption of the positive externalities flowing from the transit system, nor can the producers receive financial remuneration from the positive externalities flowing from the provision of transit, the market for transit is severely distorted. Transit service in this case will most likely be underproduced without some form of market intervention.

The community, therefore, must collectively decide to what extent the positive externalities may actually occur, and therefore, to what extent it is willing to engage in social investment to acquire these benefits. In the case of transit, political leaders in the 1960's saw it as a way to benefit communities in a number of areas, such as pollution reduction, energy conservation, decreased traffic congestion, more optimal land use patterns, increased safety, access to mobility for the transportation disadvantaged, and enhanced community viability (viability is often used in the transit literature to refer to the ease of getting from one point to the next). These arguments were delineated in national debates concerning the creation and funding of the Urban Mass Transit Association (UMTA), as well as in Utah in discussions concerning the creation and funding of the Utah Transit Authority (Smerk, 1974; Altshuler, 1979; Fjeldsted, Mangum and Waddoups, 1987).

Since the market itself cannot adequately price these goods, some other form of price estimation procedure must be used to determine whether the anticipated benefits from an investment project outweigh costs. This is the role of cost-benefit analysis. In essence, the analyst conducting a cost-benefit study is estimating a shadow price of a public good that will reflect its full benefit to not only the transit user, but to society as well. While conducting a cost-benefit study, the researcher attempts simply to enumerate costs emanating from an investment project and to weigh these costs against the benefits likely to accrue.

Cost-benefit analysis, though a popular methodology for evaluating public investment projects, has a number of theoretical shortcomings. These are considered at length in a classic article by Prest and Turvey (1965); however, the most relevant problem for our purposes lies in the inherent bias of cost-benefit analysis towards including only those items that can in some way have monetary value imputed to them. Nonquantifiable, or intangible factors, though often mentioned and discussed in the typical cost-benefit study, tend in the final analysis to be virtually ignored (see Hill, 1967; Stanley and Nash, 1977; Wilson and Neff, 1983).

Wilson and Neff (1983) argue against what they see as the increasing use of cost-benefit models used to analyze transportation technology changes. They assert that these models do not take into account "social factors" or "quality of life factors." In order for transportation researchers and planners to obtain optimal results in developing and operating a transit system, they must incorporate these social factors into their analysis. Social factors are those items which affect the quality of life for individuals in the community. Examples of these factors in the transit context are levels of mobility for various income groups or other groups such as the handicapped or youth, the income distribution in the area, the availability of alternative modes of transportation and economic activity levels, or the ease of

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economic participation. For transit policy to be effective, it must recognize these quality-of-life variables.

While it is important to account for social factors in the assessment of the vitality of a community, these factors (or important components of these factors) are not necessarily amenable to quantification or monetization. For example, research has quite adequately studied the decline in mobility levels due to short-term disruptions of bus service in strike situations. Using questionaires, researchers have extensively monitored travel behavior changes and found that during short-term disruptions most bus users found other ways to make essential trips, while discretionary trips were more severely curtailed (Wegmann, 1977).

Another aspect of transit service disruption that has been inadequately treated in the literature, however, is the erosion of long-term socio-economic opportunity for lower income or handicapped individuals who depend heavily on public transportation. This intangible component represents a real cost to society, but since it cannot be quantified, or has not successfully been quantified and had monetary value placed upon it, the factor may be left out of the typical cost-benefit procedure. Cost-benefit analysis as it is generally used, then, tends to often bias research away from intangible social factors.

The specific social factors which describe the lifestyle effects of a public investment project may be obtained by some sort of a social information generation (SIG) technique. Wilson and Neff suggest numerous SIG procedures to assist planners in isolating a problem area. For example, suppose that because of discontinuation of federal subsidies a number of bus routes must be cut back. Fiscal responsibility on the one hand demands that those routes which are the least cost-effective be discontinued. Using a traditional cost-benefit framework, the routes which were most profitable in monetary terms are obviously the ones to keep.

This type of analysis, however, tends to discount social factors. If the routes to be cut are heavily patronized by transit dependents, then life-styles may be quite severely disrupted by the action. A SIG procedure is suggested, which isolates and predicts the possible effects of decision makers' actions on the groups in question. For instance, a group of potentially affected citizens may be gathered and asked to discuss the current system in terms of its impact on their daily lives and well-being. The group discussions may be video-taped and the social data obtained separated into social variables that need to be incorporated into a transportation plan (Wilson and Neff, 1983, pp. 155-160). This method allows for decision-makers to be more in touch with the "intangibles" which represent an important part of the true costs of policy formulation, and which are usually ignored in traditional cost-benefit analysis.

Another method for evaluation of transportation projects incorporates both the necessary economic efficiency goals, as well as the social factors as outlined above. Hill (1967) introduces a technique called Goal-Achievement Analysis (GAA) as an answer to his criticisms of traditional cost-benefit analysis. He, like other critics of cost-benefit analysis, criticizes the technique for focusing on economic efficiency as the only investment criterion. He argues that "lip service" is paid to nonquantifiable factors as well as to those factors which cannot be readily assigned a market value, but in fact these are given only a secondary place in the total procedure. This tends, in his view, to exaggerate the importance of monetary factors, giving them "honored status," which they do not necessarily deserve.

Hill suggests a goal-achievement framework wherein costs and benefits are measured in terms of whether or not they lead towards or detract from a specific set of politically determined community goals. Hill suggests construction of a matrix, which contains a listing of community goals, weighted in terms of their relative value to the community. In addition, goal weights may be applied based on the policy proposal's impact on specific community groups. For example, those costs accompanying an investment project or policy change, which affect low income groups to a greater extent may be weighted more heavily than those which affect higher income groups. Costs and benefits related to each specific goal are then enumerated in monetary or quantitative form, if possible.

Intangibles are qualitatively examined and subjected to the judgement of decision-makers or the community. For instance, if one of the community's goals is to provide transportation for those who for some reason have no access to an automobile, goal-achievement analysis would isolate the costs and benefits of providing this service and search for the most cost-effective method for its achievement. This method may go further in allowing cultural, ethical, aesthetic and social as well as economic considerations to enter into public investment analysis.

A Cost-Benefit Study of the Utah Transit Authority

In light of the above examination of cost-benefit analysis and its criticisms in the transit context, the results of a recent cost-benefit analysis of the UTA are presented and discussed (see Fjeldsted, Mangum and Waddoups, 1987, 1988). It is shown that this bus mass transit system in the Salt Lake area provides a mixture of both quantifiable (in both monetary and nonmonetary terms) and "intangible" benefits.

A review of the transit analysis literature reveals that the categories most often considered as socio-economic impacts of transit are: safety, pollution, energy conservation, congestion, land-use and development, economic development and employment, and equity. All of these categories have been argued as benefits stemming from the transit system in both the national and the local contexts (Altshuler, 1979; Fjeldsted, Mangum and Waddoups, 1987; Wegmann, 1977; Haney *et al.*, 1968; Baum *et al.*, 1970; Lane *et al.*, 1979; Wilbur Smith and Associates, 1971).

Categories such as safety, pollution, energy conservation, traffic congestion and employment effects represent the easily quantifiable variables. Other categories considered, which are more difficult to quantify and to which monetary values are more difficult to assign are, access to mobility for transportation disadvantaged (equity), community viability (the ease of social and economic interaction (livability)) and land-use effects.

Safety

It is estimated that the economic cost to the community of the accidents if it were not for the UTA system is $1,920,012 (Fjeldsted, Mangum and Waddoups, 1988). This figure may be slightly high, however, because it assumes that accidents are evenly distributed through the days of the week and the time of day. Actually, more accidents per vehicle mile traveled occur during the weekends and late at night when UTA service would have little effect. This represents a slightly greater than 1 percent decrease in total community costs due to automobile accidents. Altshuler (1979), in his study of national figures, shows that economic costs saved by bus mass transit due to decreased accidents are negligible. In conclusion, safety effects of bus mass transit are measurable in some sense, but cannot possibly take the place of other more direct policy measures, such as seat belt laws, air bag installation, and improved automobile and freeway design and traffic control.

Air Pollution

Pollution reduction, like safety, is also quite readily quantifiable; however, it is more difficult to assign a monetary value to changes in pollution levels. Because pollution reduction depends on the number of private vehicle miles traveled (vmt) diverted, it necessarily can have little effect on the overall pollution in the region. This stems from transit's small potential to divert significant numbers of drivers onto the bus. It is shown that in the Wasatch Front area reduced vmt's due to transit have negligible effect on the air pollution content. Carbon monoxide is reduced by 1.74 percent, nitrous oxide by .03 percent, and hydrocarbons are actually increased by .1 percent (Fjeldsted, Mangum and Waddoups, 1987).

Altshuler's (1979) results corroborate this assessment, estimating that even a 20 percent decrease in automobile travel would produce only a 4 percent decrease in airborne emissions. Both the Sacramento and the Los Angeles studies also found that transit had negligible effects on air quality. The literature is unanimous that transit has little usefulness in controlling air pollution (Haney *et al.*, 1968; Baum *et al.*, 1970).

Energy Conservation

Energy conservation was an important question during the period when transit was first getting its major infusion of public money in the early and middle 1970's. Like the above two categories, it is easily quantifiable and depends on diverting automobile drivers from their cars into the transit system. Evidence from other studies indicates that even with large fare cuts and service increases, ridership does not increase proportionately. For example, San Diego increased its bus service by 28 percent and experienced only a 19 percent increase in ridership. It was estimated that less than half of these new riders were former drivers (Kemp, 1972). The UTA results are similar, showing that approximately .9 million gallons of gasoline are saved, which is less than .1 percent of the total consumed in the area. The total fuel savings for the area in 1985 is $865,240 (Fjeldsted, Mangum and Waddoups, 1988).

Traffic Congestion

One of the major rationales behind mass transit is that it will take cars off the road and thus decrease traffic congestion. The UTA study showed that a total of 1,800 total hours of commuting time are saved because of the diversion of automobiles from the road. Valued at $4 an hour this translates into a $2,628,008 annual savings. The obvious critique of this figure is that the marginal cost of each individual driver is the appropriate number to be assessed.

It was found that a trip during peak traffic periods without the bus system would average slightly more than a half minute longer than with the bus system present. It is questionable whether individual commuters would value a half minute savings in commute time at a rate of four dollars an hour. In addition, fewer cars on the road during peak hours may cause drivers at the margin to decide to drive, when otherwise they might not have chosen to do so. Thus, the level of absolute mobility may increase, but the level of congestion may remain unchanged.

Land Use and Development

It was originally hoped that transit would be a force for revitalization of the urban core by stimulating increased economic and social activity. Whether this has actually happened is subject to speculation. Also questionable is the need for a "vital" urban core. A bus system's routes are not fixed as those of a rail system; hence, it has a tendency to follow development patterns, such as business location decisions, rather than help to determine them.

Even in a fixed rail system such as the Bay Area Rapid Transit (BART) system, development effects attributable to the transit system are unclear. It has been argued that much of the development along Market Street in San Francisco stemmed from BART (Sheldon and Brandewein, 1973). However, upon closer analysis causal direction is not so clear. Office building construction was booming in many other western cities during that period, and one of the rationales for BART in the first place was to accommodate the rapid development anticipated to occur along Market Street (Webber *et al.*, 1976).

Bus service is also thought to contribute to economic efficiency by allowing more central city land to be used for more productive uses than parking garages; however, with the glut of office space that now haunts many cities, such as Salt Lake City, this effect may not be too important. This category, while not easily quantifiable, seems to have only a small effect on development patterns. Even if the effects were more significant, whether these are a positive or negative contribution to community vitality is far from clear.

Employment and Economic Development

A bus system, if it receives substantial federal subsidies in the way of capital and operating grants, may stimulate the local economy, creating jobs and employment. The problem with this view is that local income also leaves the state as matching funds to purchase rolling stock, construction material and

construction services from out-of-state sources. Money also is spent as federal taxes to fund other such projects around the country. Additionally, if transit subsidies did not exist, these monies may have come in some other form such as highway construction grants, which may have a stronger local component, thereby yielding a still stronger employment and income stimulation effect.

In spite of the concerns, this part of "Employment and Economic Development" may be translated into monetary terms and subjected multiplier analysis to arrive at estimates of income and employment increases due to infusions of federal money. Using the 120 sector input-output model of the Utah economy it is estimated that federal grant money contributed 8.5 million dollars to the Utah economy. The questions cited above, however, mitigate the importance of these "pork-barrel effects."

The second and more important dimension to "Economic Development and Employment" is less tangible. It deals with the viability of an area, or the ability of individuals to move from place to place during those peak times when most of the economic activity is occurring. It is obvious that the ease of mobility is essential to an efficient economic system; however, the economic benefits from this increased efficiency are largely intangible and therefore difficult to measure.

Equity

Many communities in the western United States and elsewhere have developed based on the assumption of automobile travel. If an automobile is relatively expensive to own and operate for a substantial number of individuals, a relevant question to ask is, what ethical or moral obligation does the community have to provide its members, who are not physically able or simply cannot afford to drive, with reliable and efficient public transportation?

This function of transit, like the second component of the previous factor, is largely intangible, but nevertheless is one of those functions that transit performs relatively well. In the UTA system, it was found that more than 55 percent of the riders fall in the under $15,000 income group (Wasatch Front Regional Council, 1985) and 24 percent of those have no access to an automobile (UTA Planning Department, 1986). Without the bus system, transit dependents may be forced to curtail many of their economic and social activities, or rely on friends or relatives for transportation.

Studies of transit strikes show that, in the short run, disruptions in transit dependents' activity are quite severe, though most people find alternatives for necessary trips such as work or school (Wegmann, 1977; Hopkin, 1981, 1983; Hedges, 1983; Dennerlein, 1983). This, however, does not approach the essential question, which is not short-term disruptions, but long-term loss of socio-economic opportunity to meaningfully and equally participate in society and the economy. Questions such as, "How would the lack of transit contribute to the numbers of hard-core unemployed by extending the duration and lessening the intensity of job search?" along with other ethical considerations surface in this context.

Summary

According to the UTA study, the quantifiable community benefits totaled $13,913,252.[1] The yearly local sales tax subsidy for 1985 was $22,732,446. Only 59.2 percent of the tax subsidy can be accounted for by the quantifiable community benefits. This implies that the other factors (those to which monetary value is extremely difficult to assign) must account for at least the other 40.8 percent of the community benefits to conclude that the system is fiscally sound.

Table 1

Quantifiable Community Benefits (1985):

Safety	$1,920,012
Energy Conservation	865,240
Commuter Time	2,628,008
Federal Grant	8,500,000
Total	$13,913,252

Sales tax accruing to the UTA (1985):

$22,732,446

Source: Fjeldsted, Mangum and Waddoups, 1988.

The question that emerges from results in Table 1 is, how can a transit system such as the UTA be justified? To explore this further, the nature of the factors examined as they relate to the function of transit must be analyzed. Although factors such as increases in safety, enery conservation, savings on commuters' time, and increased employment due to federal government subsidies are pleasant benefits flowing from a transit system, they are nevertheless largely peripheral to the primary function of transit. If a community goal is to increase safety on the roads, for example, direct measures such as seat belt and helmet laws, stricter enforcement of traffic laws, etc. are required. Although it is relatively easy to calculate the number of accidents that may have been averted due to the transit system, it is misleading to focus on that factor as a serious function of the system. Similar objections may be raised about the other quantifiable benefits.

The primary function of transit is the provision of a reliable alternative to automobile transportation. This is the function that transit can perform well. If the transit system performs its function well, it may potentially show significant improvement in the livability, and social and economic viability of the community. It may also improve the quality of life of those not able to drive.

It appears, therefore, that if easily quantifiable factors are the primary areas of focus in traditional cost-benefit analysis framework, a bus mass transit system is probably not going to appear fiscally sound. In the typical sprawling western city, which has developed almost exclusively around automobile transportation, a bus transit system simply does not have the capability of diverting the amount of riders from their automo-

biles to make the system appear fiscally sound based on quantitative factors as listed above.

This, then, leaves the intangible factors (i.e. viability, livability and equity) to consider. Although these factors are not as amenable to quantification, it is nonetheless these factors which directly relate to the functions of a mass transit system. It is the performance of these functions that should provide the major criteria for judgment of the current or potential system's viability. If it is determined through careful analysis that a transit system cannot perform (or is not performing) the "equity", "viability" and "livability" functions well, then perhaps the system should be altered or deemed fiscally unsound.

An important question then becomes, how is it possible to incorporate these fundamental, yet slippery, factors into a transit analysis? The beginnings of a methodology are found in the previous section where the utilization of some form of SIG and GAA are discussed. A combination of these procedures may aid in the determination of exactly which social factors are most important to a particular community. Questions such as the need for low cost transportation in the community, the desires for equity in the community, and the actual improvement of social and economic interaction stemming from the transit system, may be addressed using some sort of SIG technique. Additionally, some form of GAA may be incorporated into the investment planning procedure so that these somewhat elusive, but vital, intangibles are given reasonable place in a cost-benefit investment planning framework.

In the final analysis, a bus mass transit system may be quite effective in offering affordable transportation to transit dependents, in improving the viability of a community and offering an important alternative to automobile travel, but it does not have the potential to make anything but a small dent in such peripheral problems such as road safety, air pollution, traffic congestion and energy conservation. Other more direct public policy measures are needed to address these issues. Because the variables that are directly related to the operation of a bus mass transit are relatively unquantifiable, an analysis of a current or potential system must, therefore, not rely on a traditional form of cost-benefit analysis. Techniques such as SIG and GAA may aid in the development of an adequate assessment procedure for planners and decision-makers concerned with transit.

Conclusion

Questions involving transit analysis are important to many communities throughout the United States and elsewhere. Due to the rapid growth and development of Southern Nevada, these important issues concerning the status of the mass transit system are becoming especially important. Though this paper is not designed to be a "how to" paper on transit analysis, it does raise a number of important points about issues that arise when questions concerning the fiscal soundness and viability of an existing or potential transit system are addressed. The paper also suggests new directions in which decision-makers and analysts may direct their thinking when analyzing both current and potential transit projects.

Traditional cost-benefit analysis is a valuable technique in social investment planning; however, when it is used in the transit context, it has the potential to fail to account for important social factors that must necessarily be included in the analysis. Drawing on alternative techniques, such as SIG and GAA, may have the potential to greatly improve social investment planning involving transit.

Note

[1]Based on the objections above, this figure may be too high.

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AIDS in Nevada: An Update of Past and Future Income Losses and other Economic Implications

*by Clarence G. Ray and Vicky Carwein**

Acquired Immune Deficiency Syndrome (AIDS) continues to challenge government policy makers, fiscal planners, health care providers and other researchers as the epidemic grows. The Centers for Disease Control reports more than 120,000 cases of AIDS have been diagnosed in the United States since 1981 and estimates that one to one and a half million people in the United States are infected with the AIDS virus. It is projected that by the end of 1991 the number of cases diagnosed will reach 270,000.[1]

In the state of Nevada the estimates and projections are no less troublesome. While the total number of AIDS cases reported in Nevada, 446 since 1981 and 160 cases in 1989, may seem relatively small when compared with many other states, Nevada's incidence per 100,000 population ranks 5th in the nation at 17.8 cases per 100,000.[2] Nevada ranks only behind New York, New Jersey, Florida and California. As of Feb. 1, 1990 the Clark County Health District has confirmed that over 600 individuals have tested positive for the AIDS virus, i.e., are infected with the virus, in Clark County alone since testing began in 1984. These 600 people are known to be infected with the AIDS virus but do not have AIDS.

It is well documented in the scientific and medical communities that individuals can be infected with the AIDS virus for months or years without actually having AIDS. However, many of these individuals may well develop AIDS over the next few years. In addition, the Health Division of the Nevada Department of Human Resources estimates that another 6,000 or more, who have *not* been tested, may be infected throughout the entire State.

These numbers indicate that Nevada is already experiencing economic losses as a result of the individuals who have been diagnosed with AIDS. In addition, as the numbers of AIDS cases and individuals who are infected continue to increase, the economic losses and implications to the state will be tremendous.

The data and analyses reported in this study update and expand upon previous research conducted by the authors. In 1987 Ray and Carwein[3] calculated past and future income losses for all AIDS cases reported in Nevada through Dec. 31, 1986. A second publication in 1989 by Carwein and Ray[4] projected lost income for all cases reported in 1987 and 1988 and discussed potential impact on Federal programs, such as Social Security and Medicare, and implications for policy making at the national level.

The current study projects income losses to Nevada for all AIDS cases reported during 1989 utilizing two methods; losses adjusted for inflation and losses discounted to present value. The economic implications of these losses specifically to Nevada will then be discussed, particularly in relation to future taxation to pay for increased health care needs, issues of health and life insurance coverage and income generated by increased AIDS-related health services.

Methodology

All cases of AIDS (n=160) reported to the Centers for Disease Control by Nevada between Jan. 1, and Dec. 31, 1989, were included in the study. The following information regarding each case was utilized: month and year of AIDS diagnosis; age at diagnosis; race; sex; and occupation.[5] Since the exact date of the AIDS diagnosis was unknown in most cases, the first day of the month of diagnosis was used as the diagnosis date for all cases. The first day of the month of diagnosis was also used as the date of disability. This was done in order to maintain consistency in calculating income losses as in most cases the exact day of the month of diagnosis was not known.

An annual income for each member of the population was determined using various means. In order to assure anonymity of the subjects, occupational data were provided in a variety of ways. In 102 cases (64 percent) occupations were specified in such a way that very accurate estimates of annual income could be determined. For example, the researchers were given information about the type of establishment in which the individual worked (such as a waiter in a gourmet restaurant), or, if the person worked in management, they were told the level of management of the subject's job.

In 42 cases (26 percent), the individuals' occupations were listed as unknown. Most of these individuals were known to be employed at the time of diagnosis but had given no specific information about their occupations. The 1989 median incomes by race and sex, as published by the Bureau of Labor Statistics, were utilized for the annual incomes for 40 of 42 of these individuals whose occupations were unknown. It was assumed that use of the median income for these individuals would offset the difference between the possible low and high income earners. The remaining two individuals, even though

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capable of returning to work, were assumed to have no future incomes due to incarceration.

There were twenty-five (25) individuals who were considered to be members of the work force at the time of their diagnosis who were unemployed. Some of these unemployed individuals were not in the work force due to normal causes of unemployment, e.g., lay offs, business closings and seasonal lay offs, others were unemployed due to AIDS-related illnesses occurring prior to being officially diagnosed with AIDS and a few had had very erratic work histories. Even though these individuals were unemployed for various reasons, they were assumed to be employable.

Fifteen (15) individuals had not been in the work force, that is they were considered to have been neither employed nor unemployed and therefore were no longer actively contributing to Nevada's current output. Reasons for not having been in the work force included retirement, being in prison, homemakers who had never worked outside the home, being previously disabled due to a condition other than AIDS, and being a street person for several years.

Past income losses were calculated for each person known to be in the work force prior to the time of diagnosis (n=144). Future income losses were calculated for the 144 individuals who had past losses and one child who had future lost income but no past loss. Individual calculations were necessary because each person's income loss was specifically determined by his or her age at diagnosis, month and year of diagnosis, and projected years of work life remaining.

Each person's current annual income was determined in one of the following ways:

1. Utilization of the primary author's knowledge of the income for the particular occupation, e.g., hotel maid, nursing assistant, waiter in a gourmet restaurant. Current annual incomes for 37 individuals were determined by this method.
2. Consultation with individuals who worked in the appropriate industry and were knowledgeable of annual incomes. Current annual incomes for 41 individuals were determined by this method.
3. Utilization of various issues of *Employment and Earnings*[6] which provide current income data for various occupations and national median income information by race and sex. Current annual income for 22 individuals were determined by this method.
4. Utilization of median income by race and sex as described above. Current annual incomes for 42 individuals were determined by this method.
5. Utilization of minimum wage as described above. Current annual incomes for two (2) individuals were determined by this method.

Past income loss was defined as income that would have been earned during 1989 and was determined by calculating the income that would have been earned from the first day of the month of diagnosis through Dec. 31, 1989. Although not stated as policy, the customary date utilized by funding agencies such as Social Security to identify the date of disability for someone with AIDS is the date of diagnosis. It is known that some individuals do work beyond the date of diagnosis and some become disabled long before diagnosis.

The exact date of disability for each individual in the population of this study was unknown. Therefore, in order to maintain consistency of calculations, the first day of the month of diagnosis was utilized as the date of disability. For example, the past loss for an individual who had been diagnosed in May 1989 and had an annual income of $60,000 in 1989 would have been $40,000 ($60,000 x 0.666 year).

In order to calculate future income loss, the work life expectancy for each individual had to be determined. Work life expectancy is the projected number of years one is expected to remain in the work force and is dependant upon sex, race (white and black only), employment status (whether employed or unemployed), and age at disability or death.

Work life expectancy tables published by the Bureau of Labor Statistics[7] were used to determine the number of work years remaining for each person known to be in the work force prior to diagnosis (n=144). Men in the work force have longer work life expectancies than women. For example, a white male who has been employed and becomes disabled or dies at the age of 29 has a projected work life expectancy of 30.7 years. A white female in the work force of the same age has a projected work life expectancy of 22.4 years. A white man and woman, age 29 who are unemployed at the time disability or death have 28.7 and 19.9 years of work life remaining respectively. A factor to account for future periods of unemployment is built into each projected work life expectancy.

Individual future income losses were expressed in nominal dollars over time, i.e., they were calculated by multiplying each person's 1989 income by a growth factor of 6.4 percent for each year of work life remaining beginning on Jan. 1, 1990 (Table 3). This growth factor was chosen because it has been the average rate of inflation for the past 20 years and is a reasonable method for estimating future income increases. It was the only growth factor included in the future income projections. No attempt was made to factor in fringe benefits, bonuses, raises for promotions, etc. because of the inability to accurately access or project these increases.

These future income losses were adjusted for inflation at 6.4 percent beginning Jan. 1, 1990 and continuing through each individual's work life expectancy (Table 3). In addition, the future losses were adjusted to present value using 7.4 percent as the discount ratio (Table 4). The discount rate of 7.4 percent was selected because it represents the average annual rate of 90-day Treasury Bills for the past 20 years. This particular discount rate is one of several rates currently used by forensic economists to reduce inflation adjusted future income to present value.

Characteristics of the Population

For the year 1989 160 cases of AIDS were reported to the Centers for Disease Control from the State of Nevada. The population consisted of 147 (92 percent) males and 13 (8 percent) females ranging in age from 5 years to 74 years with the mean age 37.5 and the median age 36. As can be seen in Table 1, there was one person in the 0 to 19 year age group. This

Table 1
Age of Population by Race and Sex*

Age in Years	White Male	White Female	Black Male	Black Female	Hispanic Male	Asian Male	Total
0 - 19	--	--	--	1	--	--	1
20 - 29	23	1	1	2	3	--	30
30 - 39	55	2	11	4	5	--	77
40 - 49	20	--	5	1	4	1	31
50 - 59	9	1	1	--	1	--	12
60 & over	6	1	2	--	--	--	9
Total	**113**	**5**	**20**	**8**	**13**	**1**	**160**

Mean Age 37.5 years
Median Age 36 years

*There were no Hispanic or Asian females in the population.

individual was five years old. There were 30 (19 percent) persons aged 20-29, 77 (48 percent) aged 30-39, 31 (20 percent) aged 40-49, 12 (7 percent) aged 50-59, 9 (6 percent) aged 60 and over. Table 1 also indicates the population consisted of 118 (74 percent) Whites, 28 (17 percent) Blacks, 13 (8 percent) Hispanics, and 1 (1 percent) Asian.

The risk categories of the AIDS cases in Nevada are comparable to those throughout the United States. Sixty-nine percent of the population were homosexual/bisexual men, 16 percent were IV drug users, 7.5 percent were homosexual/bisexual men and IV drug users, 2 percent were heterosexual, 2.5 percent were transfusion related, 1 percent were children of infected parents and 2 percent were undetermined.

Work life expectancies of the 144 individuals who were considered to be in the work force at the time of diagnosis were as follows: three (2 percent) individuals had less than ten years left to work, 42 (29 percent) had 10 to 19.99 years left, 75 (52 percent) had 20-29.99 years left, and 24 (17 percent) had 30-39.99 years left to work. The median work life expectancy was almost 24 years and the mean was 22.8 years. As can be seen almost 70 percent of the population had 20 or more years to contribute to Nevada's economy as members of the work force.

Annual incomes for those who were determined to be members of the work force at the time of diagnosis (n=144) ranged from $7,000 per year to $70,000 per year. The mean income was $22,773 and the median was $22,000. Excluding the 15 individuals and the child who were not participating in the work force nor expected to participate during 1989 due to reasons such as retirement and women who remained in the home, the total past lost income for 1989 was $1,835,886 (n=144). (Table 2).

Future lost income beginning Jan. 1, 1990 was adjusted by 6.4 percent for inflation and totalled $176,758,827 (Table 2). Included in this future loss of income which was adjusted by 6.4 percent for inflation is a five-year-old child. The child obviously had no past income but had future income losses due to the expectation she would have participated in the work force had she lived. Her future earnings were based upon information found in *Lifetime Earnings for Men and Women in the United States*.[8]

To obtain another perspective of the estimate of the future income losses to Nevada due to AIDS these losses which have been adjusted for inflation need to be discounted to present value. When the inflation adjusted figure for future income losses of $176,758,827 (see Table 2) is reduced to present value, the future income losses become $62,045,906. Income losses adjusted for inflation into the future need to be discounted to present value to obtain a more accurate picture of the future losses. This can be illustrated using the following example: $10,000 adjusted for inflation at 6.4 percent over a period of twenty years will increase to $34,581; this same $34,581 when

Table 2
Income Losses Due to AIDS in Nevada for 1989 and the Future

Year	Income Loss
1989 (n=144)*	$ 1,835,886
1990-2047 (n=145)**	176,758,827
Total	**$178,594,713**

*Although the population consisted of 160 persons 16 were not counted as part of the work force for 1989; i.e., they were considered neither employed nor unemployed which included the one child.

**For purposes of calculating future income losses the child was included in the work force. Also, income losses from 1990 to 2,047 were adjusted for inflation at 6.4 percent annually.

Table 3
AIDS-Related Income Losses Adjusted for Inflation Beginning 1/1/90 by Age, Sex, and Race, 1989-2047

	WHITE				BLACK				HISPANIC		ASIAN		TOTAL	
	Male		Female		Male		Female		Male*		Male*			
	Lost Income		Lost Income		Lost Income		Lost Income		Lost Income		Lost Income		Lost Income	
Age	No.	$	No.	$	No.	$	No.	$	No.	$	No.	$	No.	$
0 - 19	--	--	--	--	--	--	1	1,868,000	--	--	--	--	1	1,868,000
20 - 29	23	48,283,273	1	906,085	1	1,718,230	2	1,665,739	3	5,075,575	--	--	30	57,648,902
30 - 39	55	81,565,717	2	1,462,233	9	5,713,955	1	475,289	5	4.555,360	--	--	70	93,772,554
40 - 49	19	17,646,645	--	--	4	1,265,692	--	--	4	1,350,468	1	1,188,536	30	21,451,341
50 - 59	7	2,355,397	--	--	1	389,775	--	--	1	260,808	--	--	9	3,005,980
60 - 69	4	822,901	--	--	1	25,035	--	--	--	--	--	--	5	847,936
Total	108	150,673,933	3	2,368,318	16	9,112,687	4	4,009,028	13	11,242,211	1	1,188,536	145**	178,594,713

*There were no Hispanic or Asian females reported in Nevada during 1989.

**Although the entire population included 160 subjects, fifteen (15) were excluded from this analysis because they had no past income and were expecrted to have no future income. All income beginning Jan. 1, 1990, has been adjusted for inflation at 6.4 percent annually.

discounted to present value at 7.4 percent over the same twenty years will be reduced to $8,294. This phenomenon occurs because estimated rates at which funds can be invested, the discount rate, are usually greater than inflationary expectations or estimates.

Table 3 presents AIDS-related income losses adjusted for inflation and Table 4 presents AIDS-related income losses discounted to present value by age, sex and race. A significant feature of the lost income shown in Tables 3 and 4 is related to the fact that AIDS is a disease which, in the United States, overwhelmingly strikes relatively young individuals. In Nevada, as well as throughout the nation, more than 80 percent of all AIDS cases are between 20 and 49 years of age. Individuals in this age span represent a very large portion of America's work force. The economic loss resulting from disability and premature death due to AIDS is therefore significant. As can be seen in Table 3, the 130 individuals age 20-49 years accounted for $172,872,797 or 97 percent of the lost income adjusted for inflation and $60,731,527 or 95 percent of the income losses discounted to present value (Table 4).

Ray and Carwein[9] previously calculated past and future income losses to Nevada for the 278 persons who were diagnosed with AIDS during the years 1982-1988. These income losses, which were also adjusted for inflation for future losses over time for the appropriate years, were $393,284,748. When added to the inflation adjusted loss of $178,594,713 for the 145 persons diagnosed with AIDS during 1989, the loss totals $571,879,461. The present value of lost income of the 438 persons who were reported with AIDS in Nevada from 1982 to the end of 1989 is $204,599,746.

Table 4
AIDS-Related Income Losses Discounted to Present Value Beginning 1/1/90 by Age, Sex, and Race, 1989-2047

	WHITE				BLACK				HISPANIC		ASIAN		TOTAL	
	Male		Female		Male		Female		Male*		Male*			
	Lost Income		Lost Income		Lost Income		Lost Income		Lost Income		Lost Income			
Age	No.	$	No.	$	No.	$	No.	$	No.	$	No.	$	No.	$
0 - 19	--	--	--	--	--	--	1	379,500	--	--	--	--	1	379,500
20 - 29	23	12,757,517	1	373,264	1	498,728	2	671,783	3	1,615,082	--	--	30	15,916,374
30 - 39	55	29,587,215	2	671,965	9	2,255,958	1	241,500	5	2,126,831	--	--	70	34,883,469
40 - 49	19	7,770,925	--	--	4	723,506	--	--	4	823,403	1	613,850	30	9,931,684
50 - 59	7	1,581,536	--	--	1	277,297	--	--	1	192,947	--	--	9	2,051,780
60 - 69	4	696,852	--	--	1	22,133	--	--	--	--	--	--	5	718,985
Total	108	52,394,045	3	1,045,229	16	3,777,622	4	1,292,785	13	4,758,263	1	613,850	145**	63,881,792

*There were no Hispanic or Asian females reported in Nevada during 1989.

**Although the entire population included 160 subjects, fifteen (15) were excluded from this analysis because they had no past income and were expected to have no future income. A discount rate of 7.4 percent was used in this table to reduce the inflation adjusted income losses of Table 3 to present value.

Economic Implications

Taxes

According to information provided by the Social Services Department of the Clark County Health District, more than 95 percent of patients with AIDS have, in the past, required public financial assistance. As of this time there are no indications that this percentage of persons requiring some form of financial aid from public agencies will decrease. It must be noted however, that not all those who have been diagnosed with AIDS will remain in Nevada until they die. Currently, no accurate statistics are available regarding the number of individuals with AIDS who have actually left the state. It is possible the amount of public financial assistance to persons with AIDS would be reduced as a result of these individuals leaving Nevada. Conversely, it is also known, although exact numbers are unavailable, that individuals with AIDS who have been reported in other states have moved to Nevada to be near family and loved ones. Some of these individuals may require public assistance.

The state of Nevada has two alternatives to pay for the increases in costs of health care to individuals with AIDS which are likely to occur in the near future. The first alternative, if existing taxes are not increased and no new taxes are enacted, would be to reduce or eliminate funding to other existing programs such as, higher education, the school districts, various social programs, police and fire protection, etc. The second alternative is to increase existing taxes or enact new ones while maintaining current funding to existing programs. Existing taxes, such as property taxes, sales taxes, business taxes, etc. may have to be increased. New taxes which may need to be enacted in Nevada include state, county and city income taxes, corporate income taxes, inheritance tax and taxes on unearned income such as capital gains, interest payments, corporate dividends, etc. Obviously a third alternative exists which would incorporate aspects of reducing funding for some programs while at the same time increasing existing taxes or enacting new ones.

None of these alternatives may, upon first consideration, be palatable to legislators, financial planners and the taxpayers of Nevada. However, if the number of AIDS cases continues to increase as projected, it is inevitable that the state of Nevada will suffer a severe financial shortfall unless sources of funding are made available to pay for AIDS care.

Health and Life Insurance

Many individuals in the state of Nevada pay premiums to private health insurance companies with the expectation that major claims will be made against the policies later in life. In addition, businesses, corporations and various industries pay premiums to private insurance companies or maintain self-funded insurance plans to provide health care to their employees. Health insurance companies invest the funds paid in premiums in order to provide a surplus for present and future health care claims. Persons with AIDS, the overwhelming majority of whom are very young, make claims against their policies when they have contributed very little in the form of premiums. Health insurance companies cannot regularly pay out large sums in claims for policy holders who have contributed relatively small amounts toward their health coverage.

Private health insurance companies, self-funded plans and even large corporate health plans will not be able to survive financially if they must pay large numbers of AIDS-related claims. Even a relatively small number of claims could bankrupt an insurance company if health insurance companies are legally forced to insure individuals who are infected with the AIDS virus because the claims will be for large amounts and the policyholders would have paid little in premiums.

In a special report on insurance and HIV infection in the January 1990 issue of *AIDS Alert*[10] Gordon Nary of the Physicians Association for AIDS Care states that patients with HIV infection now are living three to five years longer due to AZT and other improved medications and treatments. As a result, lifetime costs for HIV-related care are beginning to increase and may well reach $150,000 per patient in the very near future. If these projections are found to be accurate, the demands on the health insurance industry and other payers of care will be tremendous.

Life insurance companies face the same situation. Benefits paid out cannot exceed the total amount of premiums and the income earned on these premiums if a company is to remain solvent. Many life insurance companies have begun testing applicants for evidence of HIV infection and deny coverage to those who test positive. It is also the practice of some companies to cancel policies when it becomes known that a current policyholder is infected with the AIDS virus or has been diagnosed with AIDS. These practices of testing applicants and cancelling current policies have received a great deal of criticism from AIDS activist groups and others. However, from an economic standpoint, insurance companies simply cannot afford to pay large numbers of major claims on the deaths of young individuals who have paid little in premiums.

Income Generated by Health Services

Another issue to be considered involves the increase in income generated by the additional health and social services provided to AIDS patients. While the dollar income generated as a result of providing health and social services has not been researched it is obvious this income will partially offset the income losses due to AIDS in Nevada. A major portion (73 percent) of all AIDS cases reported in Nevada through the end of 1989 were in Clark County. Therefore, it can be expected that the majority of income derived by providing health and social services to AIDS patients will likewise occur in Clark County.

There are many difficult issues facing state insurance commissions as attempts are made to deal with the specific questions raised by this new disease. Questions of how to finance the care and services needed by individuals with AIDS will challenge lawmakers, policy planners and financial managers over the next many years.

Conclusions

It has been suggested that the lost income to Nevada's economy due to AIDS could be replaced by new people moving

into the state. It is possible that some new people could fill jobs vacated by wage earners disabled by AIDS. However, it is also possible the income of those individuals who own and operate small businesses will never be replaced. Even if all the lost income in Nevada due to AIDS could be replaced by new residents moving to the state, the economic problems related to financing health care for AIDS will remain a tremendous challenge to lawmakers and fiscal planners.

It is known that underreporting of AIDS cases is widespread throughout the United States. For example, a recent study of reporting conducted in South Carolina revealed that only 59.5 percent of AIDS cases in the state over a period of 18 months had been reported to the Centers for Disease Control.[11] It is conceivable, therefore, that the actual income losses to Nevada are greater than those presented in this paper. In Nevada, as elsewhere, AIDS diagnoses in highly visible and affluent individuals often go unreported. For example, Liberace was not reported as an AIDS case in Nevada yet his income loss is significant to the state. If Nevada is underreporting by even 20 percent, total lost income estimates will be significantly greater than the projections of this study, particularly if the unreported cases represent high income earners.

All indications are that the number of AIDS cases will continue to increase in Nevada. In 1987 the number of cases doubled over 1986. In 1988 and 1989 the increase was 30 percent over the previous year and the increases for 1990, 1991 and 1992 are projected to be between 30-40 percent per year. Given the conservative figure of 30 percent, the number of new cases in Nevada could number 208 in 1990, 270 in 1991 and 351 cases in 1992.

Current estimates are that 50 percent of individuals infected with the AIDS virus will be diagnosed with AIDS within 8-10 years from the time of infection. It is further projected that the remaining 50 percent, although not yet diagnosed with AIDS, will be symptomatic within 8-10 years of infection. That is, they will be experiencing early symptoms of AIDS and will be in need of various health care services. If the estimates of 6,000 to 7,000 individuals already infected by the end of 1989 are found to be valid, it is quite conceivable that by 1998 more than 3,000 people will have been diagnosed with AIDS, and place great demands on Nevada's health care system.

In addition, another 3,000 to 4,000 or more will be in need of health care services ranging from occasional out-patient care to hospitalization and intensive care. These numbers reflect estimates of those who are currently infected with the AIDS virus and do not include individuals who will contract the virus after 1989. It is inevitable that the number of people infected with the virus will continue to increase as AIDS begins to have more impact in the heterosexual community, IV drug user population and infants born to infected mothers. Currently, Nevada has more than 20 children known to be infected with the AIDS virus and there is little doubt this number will increase in the future.

It appears from a preliminary review of data provided by Clark County Social Services that Clark County may have to spend $50,000 or more for each AIDS patient for whom the county assumes care. Currently, a large majority of the $50,000 is utilized to pay for in-patient and out-patient care. If a figure of $50,000 per AIDS patient continues in the future, even with no adjustment for inflation, the cost for 1,000 patients could be at least $50 million. If the at least 6,000 people currently estimated to be infected with the AIDS virus require this type of financial support during the 1990's, public expenditures will exceed $300 million. It must be kept in mind that expenditures by the counties are initiated only after private insurance coverage and personal funds have been depleted. These figures may well be very conservative if the lifetime cost projection of $150,000 per patient as reported in *AIDS Alert* and previously discussed is found to be accurate. Expenditures in Nevada could exceed one billion dollars during the current decade.

While it may be argued that some of the lost income to Nevada due to AIDS will be replaced by people moving into the state the expenditures needed to provide health care to individuals who are infected with the AIDS virus and have AIDS cannot be ignored. These fiscal issues must be confronted and dealt with in order for Nevada to provide necessary health care services and remain fiscally sound during the 1990's.

Notes

[1]United States' Public Health Service Plan for the Prevention and Control of AIDS and AIDS virus, Report of the Coolfont Planning Conference, 1986:4-5.

[2]"HIV/AIDS Surveillance," Centers for Disease Control, U.S. Department of Health and Human Services, January, 1990.

[3]Ray, Clarence & Carwein, Vicky, "The Economic Impact of Lost Income in Nevada Due to AIDS" *Nevada Review of Business & Economics*, 1987(11)3:2-4.

[4]Carwein, Vicky & Ray, Clarence, "AIDS-Related Income Losses and Implications for Policy making," *AIDS and Public Policy Journal*, 1989(4)2:106-111.

[5]The data necessary to calculate past and future income loss for each individual case in Clark County and the rest of Nevada were supplied by Mr. Rick Reich, the AIDS Services Coordinator at the Clark County Health District.

[6]*Employment and Earnings*, Bureau of Labor Statistics, United States Department of Labor, 1989(36) 1-2, Jan.-Dec.

[7]*Work Life Estimates: Effects of Race and Education*, Bureau of Labor Statistics, United States Department of Labor, Bulletin 2254, Feb., 1986.
Since nothing was known about the educational levels of the 144 members of the workforce this characteristic was not utilized in determining their work life expectancies.

[8]*Lifetime Earnings Estimates for Men and Women in the United States*, Bureau of the Census, United States Department of Commerce, 1979, Series P. 60, No. 139.

[9]Op. cit.

[10]American Health Consultants, *AIDS Alert*, 1990(5)1:1-7.

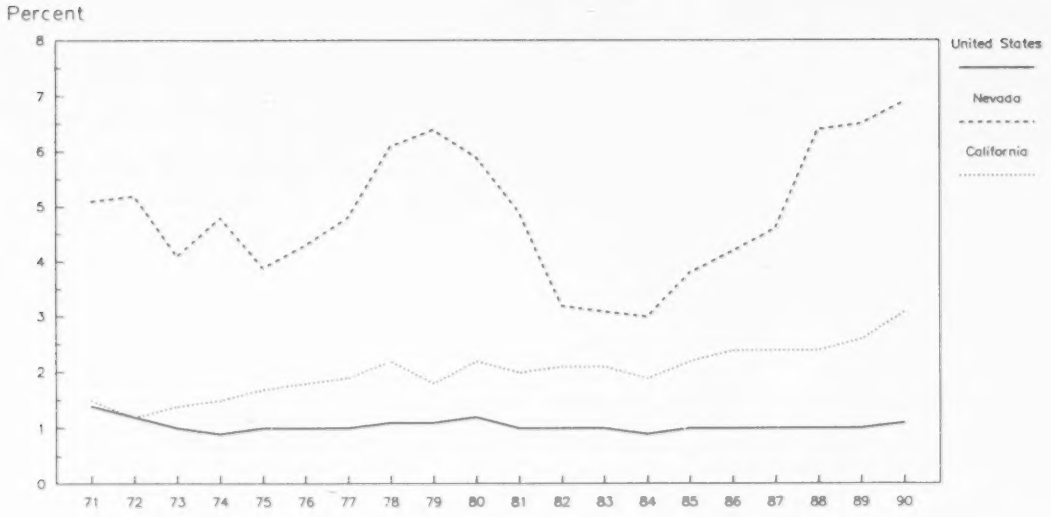
[11]Conway, George, et. al, "Underreporting of AIDS Cases in South Carolina, 1986 and 1987," *Journal of the American Medical Association*, 1989(262) 20:2859-2863.

STATE OF NEVADA ECONOMIC INDICATORS

POPULATION

United States, Nevada and California

Percent Change from Previous Year



POPULATION AND COMPONENTS: Nevada

Year	POPULATION	BIRTHS (a)	DEATHS (b)	NATURAL INCREASE (a-b)	NET MIGRATION	BIRTH RATE (per 1,000)	DEATH RATE (per 1,000)
1970	494,990	9,572	3,856	5,716	8,968	19.3	7.8
1971	520,000	9,650	3,980	5,670	19,340	18.6	7.7
1972	546,800	9,033	4,090	4,943	21,857	16.5	7.5
1973	569,200	8,600	4,624	3,976	18,424	15.1	8.1
1974	596,700	8,966	4,338	4,628	22,872	15.0	7.3
1975	620,000	9,056	4,479	4,577	18,723	14.6	7.2
1976	646,800	9,659	4,578	5,081	21,719	14.9	7.1
1977	678,100	10,519	5,622	4,897	26,403	15.5	8.3
1978	719,300	11,304	5,873	5,431	35,769	15.7	8.2
1979	765,300	12,756	6,235	6,521	39,479	16.7	8.2
1980	810,502	13,626	6,859	6,767	38,435	16.8	8.5
1981	851,150	14,439	6,819	7,620	33,028	17.0	8.0
1982	878,260	14,935	7,278	7,657	19,453	17.0	8.3
1983	904,660	14,686	7,317	7,369	19,031	16.2	8.1
1984	933,010	15,263	7,644	7,619	20,731	16.4	8.2
1985	969,450	15,745	8,313	7,432	29,008	16.2	8.6
1986	1,010,280	16,277	8,421	7,856	32,974	16.1	8.3
1987	1,057,030	17,023	8,941	8,082	38,668	16.1	8.5
1988	1,124,650	18,415	9,464	8,951	58,609	16.4	8.4
1989	1,197,260	19,688	9,592	10,096	63,764	16.4	8.0
1990	1,280,020	20,877	8,865	12,012	70,748	16.3	6.9

POPULATION COMPARISON

Year	UNITED STATES		NEVADA		CALIFORNIA		CLARK COUNTY		WASHOE COUNTY	
	Residents	% Change	Residents	% Change	Residents	% Change	Residents	% Change	Residents	% Change
1970	203,984,000	N/A	494,990	N/A	20,039,000	N/A	277,230	N/A	122,574	---
1971	206,827,000	1.4	520,000	5.1	20,346,000	1.5	293,000	5.7	128,600	4.9
1972	209,284,000	1.2	546,800	5.2	20,585,000	1.2	307,400	4.9	135,400	5.3
1973	211,357,000	1.0	569,200	4.1	20,869,000	1.4	319,400	3.9	141,000	4.1
1974	213,342,000	0.9	596,700	4.8	21,174,000	1.5	336,900	5.5	147,400	4.5
1975	215,465,000	1.0	620,000	3.9	21,538,000	1.7	351,300	4.3	152,200	3.3
1976	217,563,000	1.0	646,800	4.3	21,936,000	1.8	369,500	5.2	158,700	4.3
1977	219,760,000	1.0	678,100	4.8	22,352,000	1.9	390,000	5.5	167,800	5.7
1978	222,095,000	1.1	719,300	6.1	22,836,000	2.2	412,900	5.9	177,600	5.8
1979	224,567,000	1.1	765,300	6.4	23,257,000	1.8	441,400	6.9	187,200	5.4
1980	227,255,000	1.2	810,502	5.9	23,779,800	2.2	469,362	6.3	195,222	4.3
1981	229,637,000	1.0	851,150	5.0	24,267,000	2.0	494,460	5.3	201,620	3.3
1982	231,996,000	1.0	878,260	3.2	24,786,000	2.1	511,930	3.5	205,040	1.7
1983	234,284,000	1.0	904,660	3.0	25,309,000	2.1	531,210	3.8	210,860	2.8
1984	236,477,000	0.9	933,010	3.1	25,780,000	1.9	546,580	2.9	218,130	3.4
1985	238,736,000	1.0	969,450	3.9	26,358,000	2.2	572,140	4.7	224,340	2.8
1986	241,096,000	1.0	1,010,280	4.2	26,999,000	2.4	600,160	4.9	231,970	3.4
1987	243,427,000	1.0	1,057,030	4.6	27,655,000	2.4	631,920	5.3	238,010	2.6
1988	245,785,000	1.0	1,124,650	6.4	28,323,000	2.4	681,440	7.8	244,490	2.7
1989	248,239,000	1.0	1,197,260	6.5	29,063,000	2.6	733,180	7.6	251,130	2.7
1990	250,885,000	1.1	1,280,020	6.9	29,976,000	3.1	800,840	9.2	256,640	2.2

LABOR FORCE COMPONENTS AND UNEMPLOYMENT RATE: Nevada

Year / Month	CIVILIAN LABOR FORCE		EMPLOYMENT		UNEMPLOYMENT		UNEMPLOYMENT RATE		WAGES & SALARIES	
		SA		SA		SA		SA	($ 000)	SA ($ 000)
1980	429,992		402,992		27,000		6.3		1,408,509	
1981	463,025		430,017		33,008		7.1		1,592,085	
1982	483,000		433,992		49,008		10.1		1,638,885	
1983	486,008		438,000		48,008		9.9		1,700,372	
1984	499,992		461,000		38,992		7.8		1,859,592	
1985	520,992		478,992		42,000		8.1		2,013,998	
1986	532,008		500,008		32,000		6.0		2,182,515	
1987	557,008		522,008		35,000		6.3		2,430,662	
1988	584,000		553,992		30,000		5.1		2,753,065	
1989	602,000		572,008		30,000		5.0		3,092,858	
1990	626,000		595,000		30,983		4.9		N/A	
1990:3	615,500	617,953	585,300	590,446	30,200	27,507	4.9	4.5	* 2,530,286	* 3,167,183
1990:4	614,900	616,022	585,700	587,182	29,200	28,840	4.7	4.7		
1990:5	616,000	613,538	585,300	583,297	30,700	30,241	5.0	4.9		
1990:6	626,300	623,521	595,100	592,970	31,200	30,551	5.0	4.9	2,655,869	2,662,922
1990:7	634,400	630,581	603,700	599,824	30,600	30,757	4.8	4.9		
1990:8	631,400	631,887	602,900	601,381	28,500	30,506	4.5	4.8		
1990:9	632,800	633,038	604,500	602,092	28,300	30,947	4.5	4.9	2,816,966	2,559,539
1990:10	638,400	633,645	605,600	599,213	32,800	34,433	5.1	5.4		
1990:11	641,200	638,285	607,900	602,948	33,300	35,337	5.2	5.5		
1990:12	640,800	641,348	603,700	602,928	37,000	38,420	5.8	6.0		
1991:1	641,200	649,743	601,500	612,307	39,700	37,436	6.2	5.8		
1991:2	650,200	654,790	610,800	618,530	39,400	36,260	6.1	5.5		

* Figures available on a quarterly basis.

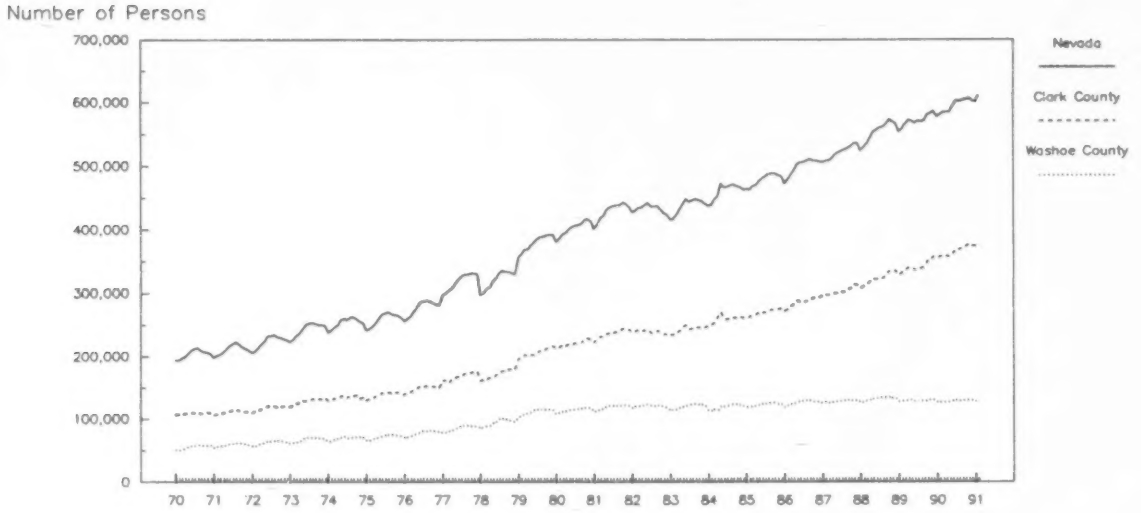
INDUSTRIAL EMPLOYMENT: Nevada

Year / Month	Mining	Manufacturing	Transportation	Public Utilities	TRADE		
					Wholesale	Retail	TOTAL
1980	6,217	19,158	12,883	11,175	13,167	67,142	80,308
1981	7,850	20,075	13,233	11,875	14,075	69,542	83,617
1982	6,617	18,767	12,950	11,967	13,708	66,175	79,883
1983	5,842	19,167	12,950	11,558	13,658	66,558	80,217
1984	6,575	21,042	13,525	11,392	14,742	71,150	85,892
1985	6,075	21,958	13,983	11,283	15,842	75,033	90,875
1986	6,308	22,258	15,150	11,392	16,708	78,025	94,733
1987	8,133	23,258	16,267	11,533	18,817	83,425	102,242
1988	11,050	24,908	17,067	11,975	20,417	89,342	109,758
1989	13,517	25,358	18,050	12,550	22,550	96,183	118,733
1990	14,542	26,408	18,875	13,542	24,033	101,317	125,350
1990:3	14,000	25,700	18,500	13,300	23,200	97,900	121,100
1990:4	14,600	26,000	18,500	13,600	23,400	98,000	121,400
1990:5	14,700	26,400	18,600	13,600	23,800	99,400	123,200
1990:6	14,800	26,500	18,600	13,800	24,200	100,200	124,400
1990:7	15,200	26,600	18,700	13,600	24,300	101,200	125,500
1990:8	14,900	26,900	19,000	13,600	24,500	102,300	126,800
1990:9	14,700	27,000	19,400	13,600	24,700	103,500	128,200
1990:10	14,600	27,200	19,400	13,800	24,800	104,600	129,400
1990:11	14,700	27,000	19,800	13,700	24,900	106,200	131,100
1990:12	14,700	27,000	20,100	13,700	25,000	108,000	133,000
1991:1	14,500	26,800	19,700	13,600	24,100	104,100	128,200
1991:2	14,200	26,800	19,600	13,700	24,100	103,100	127,200

Year / Month	SERVICE					GOVERNMENT		
	Construction	F.I.R.E.	Hotels & Gaming	Other	TOTAL	Federal	State and Local	TOTAL
1980	26,192	17,933	114,958	54,200	169,158	10,358	46,642	57,000
1981	25,375	18,275	114,792	58,942	173,733	9,500	47,592	57,092
1982	19,950	17,942	114,525	60,300	174,825	9,717	48,492	58,208
1983	19,350	18,508	114,750	62,475	177,225	9,800	48,208	58,008
1984	21,808	19,950	120,058	66,792	186,850	9,983	48,950	58,933
1985	23,925	21,400	125,483	70,942	196,425	10,450	50,067	60,517
1986	27,733	22,383	128,925	77,658	206,583	10,883	50,667	61,550
1987	30,050	23,400	137,667	83,550	221,217	11,292	52,792	64,083
1988	36,292	24,483	145,283	89,783	235,067	11,383	55,575	66,958
1989	45,058	25,858	151,875	99,192	251,067	11,775	59,033	70,808
1990	48,658	28,258	165,408	106,950	272,358	12,942	63,225	76,167
1990:3	46,400	27,400	159,500	104,900	264,400	12,000	63,500	75,500
1990:4	47,000	27,900	162,600	104,400	267,000	12,700	63,200	75,900
1990:5	48,300	28,300	163,800	106,200	270,000	12,600	63,800	76,400
1990:6	49,100	28,600	166,500	107,400	273,900	13,500	61,700	75,200
1990:7	50,200	28,800	170,700	107,100	277,800	13,600	58,100	71,700
1990:8	51,200	29,000	172,900	108,400	281,300	13,600	58,300	71,900
1990:9	50,800	28,800	170,600	109,200	279,800	13,600	64,200	77,800
1990:10	50,900	28,700	169,500	109,800	279,300	13,400	66,800	80,200
1990:11	50,500	28,700	168,300	110,800	279,100	13,400	67,300	80,700
1990:12	49,900	28,600	164,100	109,900	274,000	13,300	67,300	80,600
1991:1	46,600	28,600	162,400	109,500	271,900	13,400	65,900	79,300
1991:2	45,400	28,400	160,800	109,800	270,600	13,500	68,500	82,000

TOTAL CIVILIAN EMPLOYMENT

Nevada, Clark County and Washoe County



TAXABLE SALES, GAMING REVENUES, PERSONAL INCOME: Nevada

Year / Quarter	TAXABLE SALES		TAXABLE GAMING REVENUES		PERSONAL INCOME	
	($ 000)	% Change	($000)	% Change	($ millions)	% Change
1980	6,382,474	3.5	2,383,419	12.4	9,250.0	15.4
1981	6,741,715	5.6	2,532,204	6.2	10,458.8	13.1
1982	6,539,310	-3.0	2,627,543	3.8	10,956.5	4.8
1983	6,853,869	4.8	2,846,509	8.3	11,599.8	5.9
1984	7.624,717	11.2	3,075,125	8.0	12,678.8	9.3
1985	8,384,794	10.0	3,314,434	7.8	13,801.5	8.9
1986	9,163,504	9.3	3,482,097	5.1	14,931.8	8.2
1987	10,224,239	11.6	3,925,146	12.7	16,480.3	10.4
1988	11,768,439	15.1	4,270,073	8.8	18,821.8	14.2
1989	13,625,604	15.8	4,590,198	7.5	21,402.8	13.7
1990	14,619,380	7.3	5,237,770	14.1	N/A	N/A
1989:3	3,422,942	11.9	1,214,645	7.2	21,643.0	12.8
1989:4	3,765,236	18.8	1,118,641	6.4	22,230.0	12.7
1990:1	3,384,289	7.9	1,274,440	15.7	22,854.0	11.0
1990:2	3,749,276	13.6	1,304,691	12.9	23,189.0	9.7
1990:3	3,710,861	8.4	1,369,883	12.8	23,880.0	10.3
1990:4	3,774,954	0.3	1,288,756	15.2	N/A	N/A
1991:1			1,352,451	6		

Data Note: Annual values for Taxable Sales and Taxable Gaming Revenues are sums of quarterly values.

AVERAGE WEEKLY HOURS: Nevada

Year / Month	Mining	Construction	Manufacturing	Durable Goods	Non-Durable Goods	Public Utilities	TRADE *		
							Wholesale	Retail	TOTAL
1980	39.8	35.1	38.2	39.3	35.9	40.7	N/A	N/A	33.8
1981	41.3	35.8	38.6	39.3	37.0	40.2	N/A	N/A	34.0
1982	41.1	34.8	37.4	37.8	36.7	39.8	N/A	N/A	34.0
1983	43.0	35.4	38.8	39.0	38.3	40.2	N/A	N/A	34.3
1984	42.9	35.9	39.8	40.1	39.2	40.7	N/A	N/A	34.0
1985	42.9	36.0	40.4	40.8	39.5	40.9	N/A	N/A	34.2
1986	42.9	37.1	40.2	41.1	38.4	40.4	N/A	N/A	33.8
1987	42.8	36.0	40.3	41.4	38.3	40.4	N/A	N/A	34.4
1988	44.0	36.8	39.9	40.8	37.8	40.6	N/A	N/A	34.6
1989	43.7	38.4	40.9	42.4	38.3	41.3	40.7	31.9	36.1
1990	43.4	38.0	40.7	42.1	38.1	42.3	40.2	31.9	33.4
1990:3	42.9	38.5	40.8	42.3	38.2	42.5	40.4	31.1	32.9
1990:4	44.9	38.1	40.3	41.5	38.2	42.6	39.6	32.5	33.8
1990:5	44.1	38.6	39.8	42.5	34.9	43.2	40.6	31.5	33.2
1990:6	43.6	38.1	40.5	42.8	36.5	40.2	40.1	31.6	33.2
1990:7	43.6	37.5	40.9	42.4	38.2	42.4	40.5	32.5	34.0
1990:8	42.6	38.4	40.2	41.4	38.0	42.3	41.1	32.0	33.6
1990:9	44.4	38.8	40.5	41.0	39.6	42.5	40.0	32.7	34.0
1990:10	42.2	38.6	40.6	41.6	38.9	43.8	39.7	31.8	33.2
1990:11	43.0	35.3	41.2	41.8	40.0	41.5	39.7	31.7	33.1
1990:12	43.9	39.5	42.4	44.7	38.2	41.6	40.5	32.7	34.1
1991:1	43.5	38.6	40.0	41.7	37.0	41.5	40.0	31.6	33.1
1991:2	43.4	38.1	39.9	41.1	37.8	40.9	39.7	30.5	32.2

* Excluding Food & Drink

AVERAGE HOURLY EARNINGS: Nevada

Year / Month	Mining	Construction	Manufacturing	Durable Goods	Non-Durable Goods	Public Utilities	TRADE *		
							Wholesale	Retail	TOTAL
1980	9.29	14.06	7.70	7.96	7.29	8.55	N/A	N/A	6.74
1981	10.67	15.86	8.37	8.82	7.47	9.76	N/A	N/A	7.09
1982	11.52	16.93	8.80	9.26	7.89	10.78	N/A	N/A	7.56
1983	12.25	17.03	9.01	9.41	8.21	11.76	N/A	N/A	7.81
1984	12.87	16.87	9.11	9.52	8.36	12.39	N/A	N/A	8.12
1985	13.25	16.21	9.16	9.42	8.62	12.99	N/A	N/A	8.36
1986	14.01	16.17	9.35	9.61	8.82	13.74	N/A	N/A	8.50
1987	14.42	16.32	9.74	9.98	9.28	14.15	N/A	N/A	8.79
1988	14.56	16.19	10.11	10.27	9.71	14.62	N/A	N/A	9.10
1989	15.57	16.74	10.33	10.64	9.74	15.26	11.00	7.72	9.34
1990	15.81	16.94	11.05	11.10	10.94	15.94	11.35	8.37	9.02
1990:3	15.86	17.15	10.90	10.97	10.77	15.21	11.14	8.42	9.03
1990:4	15.96	16.79	11.06	11.16	10.87	15.65	11.46	8.29	8.97
1990:5	15.95	16.75	10.87	10.94	10.70	16.02	11.23	8.33	8.97
1990:6	15.83	16.57	11.08	11.24	10.76	15.84	11.56	8.47	9.16
1990:7	16.01	16.77	11.11	11.18	10.96	16.16	11.46	8.56	9.20
1990:8	15.49	16.97	11.33	11.43	11.11	16.69	11.14	8.42	9.03
1990:9	15.74	17.12	10.96	10.95	10.97	16.08	11.50	8.36	9.03
1990:10	15.75	16.98	11.04	11.05	11.01	16.51	11.41	8.33	8.99
1990:11	15.62	17.37	10.96	10.94	11.00	16.04	11.52	8.62	9.23
1990:12	16.09	17.37	11.21	11.12	11.40	16.12	11.51	8.50	9.12
1991:1	15.88	17.18	11.00	10.96	11.10	16.17	11.59	8.39	9.08
1991:2	16.57	17.05	10.78	10.88	10.59	16.04	11.66	8.58	9.26

* Excluding Food & Drink

CONSTRUCTION - Residential Permits: NEVADA

Year / Month	UNITS		VALUATIONS		
	TOTAL	Single Family	TOTAL ($ 000)	Single Family ($ 000)	Non-Residential ($ Millions)
1980	11,752	6,275	457,871	320,138	511.4
1981	10,267	5,793	370,555	262,018	443.8
1982	8,138	4,364	293,128	210,192	257.9
1983	15,982	8,426	572,296	396,795	456.9
1984	13,749	6,698	89,447	393,717	442.0
1985	14,004	7,385	593,602	414,092	496.4
1986	15,655	9,940	758,242	593,747	592.8
1987	16,345	10,178	785,850	611,136	540.5
1989	29,143	16,129	1,559,177	1,130,491	592.3
1990	24,945	14,510	1,621,667	1,228,107	572.4
1990:1	2,650	1,061	171,880	96,019	78.4
1990:2	1,973	1,135	109,609	82,115	82.6
1990:3	2,752	1,311	186,048	121,632	53.0
1990:4	2,373	1,379	196,696	148,512	N/A
1990:5	2,212	1,593	186,683	157,591	75.0
1990:6	2,389	1,262	133,365	97,436	74.1
1990:7	2,088	1,265	124,516	98,992	77.8
1990:8	3,111	1,621	181,834	134,335	92.9
1990:9	1,643	1,058	99,582	82,134	38.6
1990:10	1,471	1,107	91,205	84,400	N/A
1990:11	1,135	910	68,818	64,484	N/A
1990:12	1,148	808	71,431	60,457	N/A

Data Note: Annual values are sums of monthly values.

HIGHWAY TRAFFIC COUNT - (Both directions of travel)

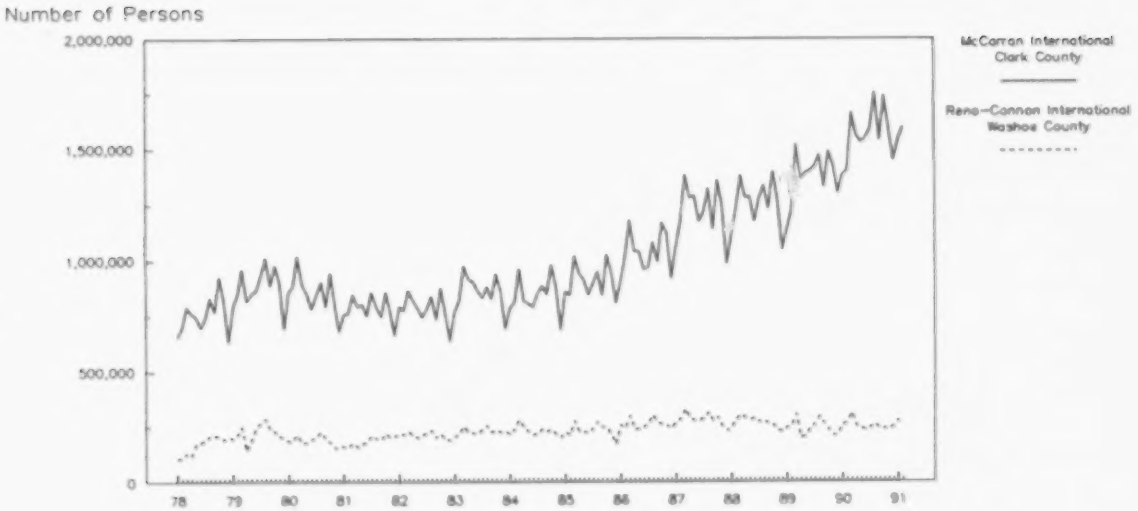
Year / Month	VEHICLES PER DAY								
	I-15 at Jean CA Border	I-15 at Apex East of Las Vegas	US 50 South Tahoe CA Border	I-80 at Wells East of Elko	US 93 at Contact Idaho Border	US 95 at Orovada OR Border	I-80 at Verdi West of Reno	US 395 at Bordertown North of Reno	US 6/50/90 at Ely Utah Border
1980	4,833,359	2,532,281	11,256,603	1,077,094	445,097	395,293	5,827,480	2,040,682	321,726
1981	5,166,067	2,846,804	11,339,881	1,180,627	487,838	408,276	6,033,960	2,121,405	319,289
1982	5,238,269	2,958,128	10,869,896	1,095,956	445,294	381,522	5,820,926	2,022,780	281,689
1983	5,452,274	2,900,552	10,811,948	1,093,691	469,513	388,955	6,148,445	2,156,360	258,850
1984	5,727,717	2,981,679	11,631,646	1,168,169	489,210	400,497	6,498,795	2,291,324	284,632
1985	11,257,084	5,929,367	22,627,216	2,328,684	935,065	763,544	12,840,430	4,535,924	544,060
1986	6,215,637	3,241,187	12,147,053	1,285,330	494,739	399,074	6,979,696	2,424,476	265,347
1987	6,598,336	3,593,780	12,463,463	1,407,453	531,335	435,601	7,438,645	2,557,512	291,228
1988	7,130,132	3,850,896	12,637,785	1,578,468	583,121	474,262	7,856,844	2,617,250	311,181
1989	7,921,381	4,190,977	12,807,332	1,653,364	612,362	473,764	7,716,028	2,661,320	334,217
1990	8,671,764	4,434,903	12,900,701	1,640,634	617,370	488,042	7,955,413	2,666,781	348,843
1990:3	672,279	354,532	1,053,012	108,506	48,741	38,412	587,256	180,633	23,209
1990:4	737,893	367,906	978,984	125,807	49,835	40,076	643,959	216,057	28,051
1990:5	758,671	372,984	1,074,747	146,566	51,884	43,799	687,720	243,210	33,150
1990:6	797,510	417,191	1,171,351	180,597	63,859	48,770	778,259	267,567	38,067
1990:7	854,731	439,840	1,361,580	192,735	71,449	50,377	838,364	289,474	40,307
1990:8	891,492	476,249	1,375,396	201,132	70,949	51,911	865,196	295,262	40,766
1990:9	745,084	381,181	1,146,365	158,139	53,925	45,153	755,508	257,668	34,034
1990:10	672,039	381,384	1,034,390	140,969	52,245	43,222	674,285	239,633	33,036
1990:11	699,671	338,654	906,549	112,444	45,070	40,010	616,593	208,190	26,802
1990:12	688,045	336,333	949,830	95,509	37,419	30,011	552,072	172,437	17,652
1991:1	611,900	301,683	968,444	91,820	34,364	27,782	541,370	158,959	15,879
1991:2	577,562	309,832	928,753	90,794	37,264	29,836	553,844	169,302	16,676
1991:3	708,863	394,645	905,835	105,169	48,816	40,123	525,266	189,348	20,468
1991:4	743,658	377,903	928,848	114,622	47,129	37,117	646,936	216,752	11,779

Data Note: Annual values are sums of monthly values.

AIRPORT PASSENGER COUNT

Enplaned and Deplaned Passengers

Passengers per Month



AIRPORT PASSENGER COUNT
(Total Enplaned and Deplaned Passengers)

Year / Month	McCarran International	% Change	Reno-Cannon International	% Change
1980	10,302,106		2,502,098	
1981	9,469,817	-8.1	2,500,592	-0.1
1982	9,438,979	-0.3	2,595,133	3.8
1983	10,311,907	9.2	2,793,225	7.6
1984	10,142,744	-1.6	2,823,359	1.1
1985	10,924,047	7.7	2,829,024	0.2
1986	12,428,748	13.8	3,170,619	12.1
1987	14,154,666	13.9	3,087,433	-2.6
1988	16,150,157	14.1	3,252,548	5.3
1989	16,909,744	4.7	2,996,516	-7.9
1990	18,755,781	10.9	3,077,398	2.7
1990:3	1,663,363	9.4	314,523	2.4
1990:4	1,561,080	14.3	254,823	26.0
1990:5	1,529,485	9.9	242,834	15.2
1990:6	1,549,293	10.5	237,143	-2.3
1990:7	1,588,077	11.8	248,197	-6.0
1990:8	1,754,995	19.2	265,358	-10.9
1990:9	1,538,554	15.7	243,362	-9.1
1990:10	1,738,615	16.8	241,763	1.2
1990:11	1,595,183	11.8	242,967	13.5
1990:12	1,450,325	11.2	253,637	16.1
1991:1	1,534,670	10.9	280,649	7.3
1991:2	1,595,816	13.7	275,571	1.6

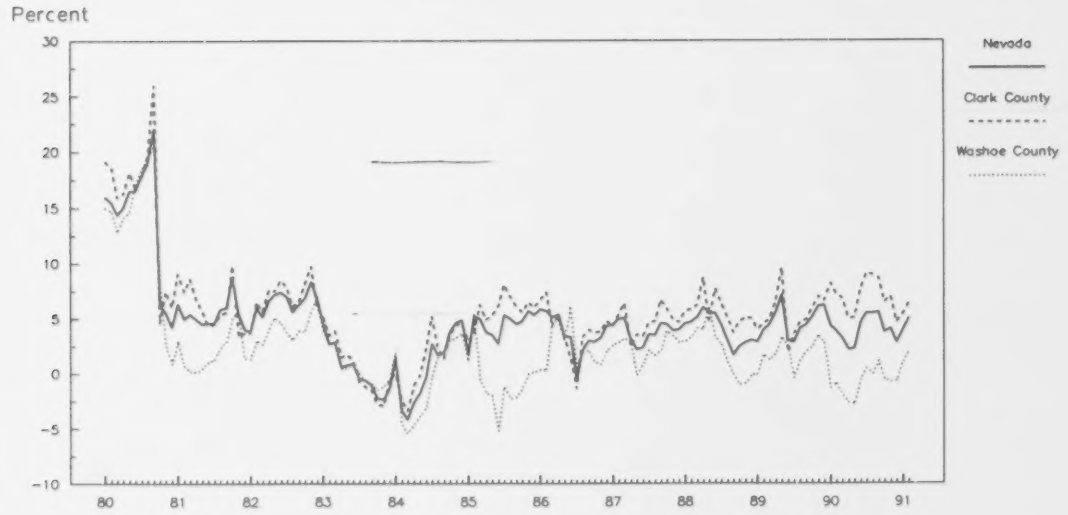
Data Note: Annual values are sums of monthly values.

METROPOLITAN AREAS

TOTAL CIVILIAN EMPLOYMENT

Nevada, Clark County and Washoe County

Percent Change from Year-Ago-Month



LABOR FORCE COMPONENTS and UNEMPLOYMENT RATE: Clark County

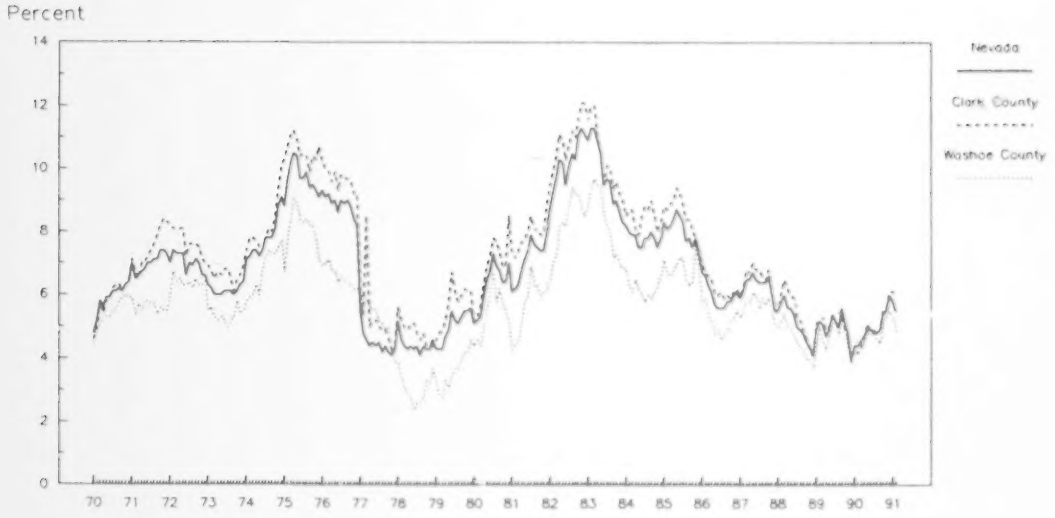
Year / Month	CIVILIAN LABOR FORCE		EMPLOYMENT		UNEMPLOYMENT		UNEMPLOYMENT RATE		WAGES & SALARIES	
		SA		SA		SA		SA	($ 000)	SA ($ 000)
1980	237,708		221,492		16,217		6.8		3,060,333	
1981	257,767		237,325		20,442		7.9		3,459,795	
1982	269,317		239,958		29,358		10.9		3,555,355	
1983	272,067		244,000		28,067		10.3		3,748,609	
1984	284,450		260,325		24,125		8.5		4,061,442	
1985	296,275		270,900		25,375		8.6		4,416,837	
1986	305,392		286,267		19,125		6.3		4,854,194	
1987	324,617		303,575		21,042		6.5		5,484,126	
1988	342,008		323,650		18,375		5.4		6,236,953	
1989	359,875		342,042		17,850		5.0		7,182,865	
1990	385,308		366,292		19,000		4.9		N/A	
1990:3	378,000	377,570	360,700	361,318	17,300	16,252	4.6	4.3	* 2,005,810	* 2,036,166
1990:4	376,300	376,030	358,600	358,563	17,700	17,467	4.7	4.6		
1990:5	377,600	376,707	358,300	357,322	19,200	19,385	5.1	5.1		
1990:6	383,400	384,435	363,500	365,737	19,900	18,698	5.2	4.9	2,083,516	2,102,696
1990:7	388,900	389,811	369,600	371,173	19,400	18,639	5.0	4.8		
1990:8	389,000	392,011	370,300	373,083	18,600	18,928	4.8	4.8		
1990:9	391,200	392,527	372,500	373,326	18,600	19,200	4.8	4.9	N/A	
1990:10	395,600	393,018	374,400	371,459	21,200	21,559	5.4	5.5		
1990:11	399,300	396,360	378,400	374,332	20,900	22,028	5.2	5.6		
1990:12	397,900	396,557	375,100	372,561	22,800	23,996	5.7	6.1	N/A	
1991:1	399,600	401,376	375,700	377,056	23,800	24,320	6.0	6.1		
1991:2	405,400	406,906	380,900	382,610	24,500	24,297	6.0	6.0		

* Figures available on a quarterly basis

UNEMPLOYMENT RATES

Nevada, Clark County, and Washoe County, SA

Unemployment as a Percent of Labor Force



LABOR FORCE COMPONENTS and UNEMPLOYMENT RATE: Washoe County

Year / Month	CIVILIAN LABOR FORCE		EMPLOYMENT		UNEMPLOYMENT		UNEMPLOYMENT RATE		WAGES & SALARIES	
		SA		SA		SA		SA	($ 000)	SA ($ 000)
1980	121,983		115,442		6,542		5.4		1,593,378	
1981	127,292		120,150		7,142		5.6		1,730,562	
1982	132,383		121,517		10,867		8.2		1,774,765	
1983	132,075		121,017		11,058		8.4		1,810,658	
1984	128,008		120,050		7,958		6.2		2,010,233	
1985	132,700		123,642		9,058		6.8		2,158,631	
1986	134,242		127,233		7,008		5.2		2,326,948	
1987	137,083		129,275		7,808		5.7		2,541,023	
1988	139,233		132,775		6,467		4.6		2,766,811	
1989	136,850		130,375		6,475		4.7		2,957,204	
1990	135,825		129,333		6,508		4.8		N/A	
1990:3	134,600	135,582	127,800	129,531	6,900	6,051	5.1	4.5	• 768,776	• 794,849
1990:4	134,200	135,180	128,000	128,975	6,200	6,206	4.6	4.6		
1990:5	133,900	133,679	127,600	127,236	6,300	6,443	4.7	4.8		
1990:6	135,600	135,691	129,500	129,240	6,100	6,450	4.5	4.8	805,405	818,092
1990:7	136,600	135,998	130,600	129,505	6,000	6,493	4.4	4.8		
1990:8	135,600	135,636	130,200	129,405	5,400	6,232	4.0	4.6		
1990:9	135,500	135,090	130,300	128,950	5,200	6,140	3.8	4.5	N/A	
1990:10	137,500	136,340	131,200	129,336	6,300	7,004	4.6	5.1		
1990:11	137,600	136,829	130,800	129,595	6,800	7,233	4.9	5.3		
1990:12	138,300	136,969	130,400	129,453	7,900	7,516	5.7	5.5	N/A	
1991:1	137,600	139,332	128,800	131,951	8,800	7,381	6.4	5.3		
1991:2	139,100	139,888	130,800	133,065	8,300	6,823	6.0	4.9		

• Figures available on a quarterly basis

INDUSTRIAL EMPLOYMENT: Clark County

(Number of Jobs)

Year / Month	Mining	Manufacturing	Transportation	Public Utilities	TRADE			Construction
					Wholesale	Retail	TOTAL	
1980	475	6,858	7,700	5,425	6,167	39,625	45,792	14,083
1981	508	7,283	8,008	5,825	6,450	41,608	48,058	14,517
1982	425	6,617	7,800	6,083	6,342	39,092	45,433	12,000
1983	300	7,092	7,842	5,958	6,667	39,308	45,975	11,792
1984	300	7,458	8,108	6,075	7,483	41,333	48,817	13,275
1985	242	7,792	8,383	6,025	8,308	43,867	52,175	14,267
1986	300	8,050	8,908	5,983	8,950	45,950	54,900	16,942
1987	283	8,700	9,658	6,058	10,100	50,200	60,300	18,650
1988	217	9,433	9,950	6,400	11,008	53,808	64,817	22,642
1989	258	9,900	10,983	6,850	12,250	59,150	71,400	31,258
1990	267	10,750	11,817	7,533	12,975	63,108	76,083	35,533
1990:3	200	10,500	11,400	7,300	12,700	62,000	74,700	34,800
1990:4	200	10,700	11,600	7,600	12,700	61,500	74,200	34,700
1990:5	300	10,900	11,600	7,700	12,800	62,400	75,200	35,300
1990:6	300	10,900	11,700	7,700	13,000	62,500	75,500	35,800
1990:7	300	11,000	11,800	7,500	13,100	62,800	75,900	36,200
1990:8	300	11,000	12,000	7,600	13,200	63,400	76,600	37,000
1990:9	300	11,000	12,100	7,600	13,300	63,600	76,900	36,600
1990:10	300	11,000	12,200	7,800	13,300	64,000	77,300	36,700
1990:11	300	10,800	12,500	7,700	13,400	65,400	78,800	36,500
1990:12	300	10,800	12,600	7,700	13,500	66,900	80,400	36,100
1991:1	300	10,600	12,500	7,700	13,100	64,600	77,700	34,500
1991:2	300	10,600	12,500	7,700	13,200	64,400	77,600	34,300

INDUSTRIAL EMPLOYMENT: Clark County

(Number of Jobs)

Year / Month	F.I.R.E.	SERVICE			GOVERNMENT		
		Hotels & Gaming	Other	TOTAL	Federal	State and Local	TOTAL
1980	10,083	69,883	31,208	101,092	4,842	21,058	25,900
1981	10,133	70,233	33,167	103,400	4,758	21,650	26,408
1982	10,133	70,467	32,608	103,075	4,958	22,558	27,517
1983	10,475	71,000	33,642	104,642	4,942	22,350	27,292
1984	11,475	73,592	36,208	109,800	5,158	22,950	28,108
1985	12,617	77,858	37,983	115,842	5,500	23,792	29,292
1986	13,300	81,158	41,858	123,017	5,875	24,908	30,783
1987	14,050	88,675	45,950	134,625	6,158	26,117	32,275
1988	15,208	95,117	49,925	145,042	6,383	27,508	33,892
1989	16,733	100,525	56,350	156,875	6,625	29,350	35,975
1990	18,358	114,350	63,275	177,625	7,350	31,742	39,092
1990:3	17,800	109,500	61,700	171,200	6,800	31,800	38,600
1990:4	18,100	111,700	61,000	172,700	7,100	31,700	38,800
1990:5	18,300	112,600	62,300	174,900	6,900	32,000	38,900
1990:6	18,500	113,800	62,800	176,600	7,700	30,500	38,200
1990:7	18,600	117,700	62,900	180,600	7,700	28,400	36,100
1990:8	18,700	119,500	64,100	183,600	7,700	28,500	36,200
1990:9	18,600	118,300	64,800	183,100	7,700	32,500	40,200
1990:10	18,700	118,100	65,000	183,100	7,700	33,900	41,600
1990:11	18,900	118,300	67,400	185,700	7,800	34,400	42,200
1990:12	18,800	115,800	66,300	182,100	7,700	34,500	42,200
1991:1	18,800	115,200	67,100	182,300	7,700	33,500	41,200
1991:2	18,800	114,200	67,000	181,200	7,800	34,700	42,500

INDUSTRIAL EMPLOYMENT: Washoe County

(Number of Jobs)

Year / Month	Mining	Manufacturing	Transportation	Public Utilities	TRADE			Construction
					Wholesale	Retail	TOTAL	
1980	992	8,100	3,767	4,342	5,925	18,692	24,617	7,192
1981	867	8,317	3,692	4,550	6,433	18,583	25,017	6,375
1982	658	7,833	3,775	4,383	6,200	18,108	24,308	5,008
1983	592	7,508	3,792	4,108	5,925	18,433	24,358	4,833
1984	725	8,125	3,933	3,933	6,033	20,167	26,200	5,425
1985	700	8,333	4,033	3,892	6,200	21,183	27,383	6,017
1986	758	8,225	4,625	4,033	6,458	21,808	28,267	6,775
1987	933	8,450	4,850	4,150	7,283	22,267	29,550	6,925
1988	1,225	8,650	5,192	4,208	7,725	23,592	31,317	7,367
1989	1,442	8,525	5,433	4,267	8,300	24,050	32,350	7,342
1990	1,508	8,775	5,400	4,375	8,892	24,633	33,525	7,475
1990:3	1,400	8,700	5,500	4,300	8,600	23,500	32,100	6,700
1990:4	1,500	8,700	5,400	4,400	8,600	23,800	32,400	7,300
1990:5	1,500	8,800	5,400	4,400	8,900	24,100	33,000	7,600
1990:6	1,600	8,800	5,300	4,500	9,000	24,400	33,400	7,800
1990:7	1,600	8,700	5,200	4,500	9,000	24,800	33,800	7,800
1990:8	1,600	8,800	5,300	4,400	9,100	24,800	33,900	7,900
1990:9	1,500	8,800	5,400	4,400	9,100	25,300	34,400	7,900
1990:10	1,600	8,900	5,400	4,400	9,100	25,400	34,500	7,900
1990:11	1,500	8,900	5,600	4,300	9,100	25,900	35,000	7,700
1990:12	1,500	9,000	5,700	4,300	9,200	26,300	35,500	7,500
1991:1	1,500	8,900	5,500	4,300	9,000	25,200	34,200	6,800
1991:2	1,500	8,900	5,500	4,300	8,800	24,700	33,500	6,800

INDUSTRIAL EMPLOYMENT: Washoe County

(Number of Jobs)

Year / Month	F.I.R.E	SERVICE			GOVERNMENT		
		Hotels & Gaming	Other	TOTAL	Federal	State and Local	TOTAL
1980	6,075	28,608	14,550	43,158	2,717	13,425	16,142
1981	6,142	28,175	15,458	43,633	2,575	13,517	16,092
1982	6,108	27,808	15,975	43,783	2,683	13,842	16,525
1983	6,183	27,242	16,508	43,750	2,758	13,717	16,475
1984	6,400	28,958	17,792	46,750	2,767	13,883	16,650
1985	6,392	29,258	19,033	48,292	2,867	13,833	16,700
1986	6,750	29,367	21,742	51,108	2,842	12,767	15,608
1987	7,008	30,308	23,308	53,617	2,908	13,142	16,050
1988	6,842	31,033	24,208	55,242	2,908	13,875	16,783
1989	6,592	30,875	26,417	57,292	2,958	14,417	17,375
1990	7,175	30,825	27,025	57,850	3,233	15,117	18,350
1990:3	6,900	30,300	26,300	56,600	3,100	15,400	18,500
1990:4	7,100	30,800	26,700	57,500	3,200	15,300	18,500
1990:5	7,300	30,700	27,000	57,700	3,400	15,400	18,800
1990:6	7,300	31,300	27,400	58,700	3,300	14,900	18,200
1990:7	7,300	31,600	27,400	59,000	3,300	13,800	17,100
1990:8	7,500	32,200	27,400	59,600	3,300	13,900	17,200
1990:9	7,300	31,500	27,400	58,900	3,300	15,000	18,300
1990:10	7,200	31,200	27,600	58,800	3,300	15,800	19,100
1990:11	7,200	30,300	27,800	58,100	3,300	15,800	19,100
1990:12	7,200	29,400	27,800	57,200	3,300	16,100	19,400
1991:1	7,300	28,900	27,000	55,900	3,400	15,200	18,600
1991:2	7,200	28,500	27,000	55,500	3,400	16,100	19,500

AVERAGE WEEKLY HOURS: Clark County

Year / Month	Construction	Manufacturing	Durable Goods	Non-Durable Goods	Public Utilities	Transportation *	Wholesale Trade	Retail Trade
1980	33.8	39.4	40.1	38.1	N/A	40.0	38.5	29.7
1981	35.5	39.9	40.3	38.8	N/A	40.4	38.2	31.3
1982	34.3	39.2	39.0	39.5	N/A	39.9	37.6	30.8
1983	35.1	39.5	39.2	39.9	N/A	40.1	38.1	31.0
1984	35.6	39.5	39.1	40.2	N/A	40.4	37.6	31.1
1985	35.6	39.9	39.4	40.5	N/A	40.7	38.3	30.9
1986	36.5	39.4	39.4	39.4	N/A	40.5	37.4	30.6
1987	35.6	40.3	40.8	39.4	N/A	40.4	38.0	31.3
1988	36.6	40.2	40.6	39.5	N/A	40.9	39.2	31.7
1989	38.3	42.5	44.0	40.2	41.7	33.8	39.3	32.7
1990	38.2	41.9	43.5	39.0	41.9	34.6	39.8	33.6
1990:3	38.8	42.7	43.7	41.0	41.8	32.9	39.7	31.6
1990:4	38.0	42.4	43.4	40.7	42.5	35.0	39.0	34.2
1990:5	38.8	39.8	43.5	33.1	43.7	34.5	40.5	33.4
1990:6	38.4	42.2	45.4	36.4	38.6	34.8	40.1	33.7
1990:7	37.6	42.5	43.8	40.0	41.7	35.0	40.0	34.1
1990:8	38.6	41.2	42.4	38.7	41.7	34.6	40.6	33.4
1990:9	39.4	41.6	42.3	40.4	42.3	35.1	39.0	34.3
1990:10	39.1	41.0	42.4	38.6	45.0	35.2	39.6	34.3
1990:11	34.7	41.3	42.2	39.9	41.1	35.4	40.3	34.4
1990:12	40.6	43.1	45.3	39.2	41.4	35.4	39.7	34.6
1991:1	38.4	40.5	41.8	38.2	41.4	34.6	39.4	33.7
1991:2	37.9	39.6	40.2	38.6	40.9	33.4	39.4	32.3

* Excluding Railroads.

AVERAGE HOURLY EARNINGS: Clark County

Year / Month	Construction	Manufacturing	Durable Goods	Non-Durable Goods	Public Utilities	Transportation	Wholesale Trade	Retail Trade
1980	13.99	9.11	9.56	8.13	N/A	8.27	7.82	5.85
1981	15.68	10.51	11.39	8.42	N/A	9.21	8.54	6.01
1982	17.18	10.68	11.51	9.19	N/A	9.94	9.05	6.47
1983	16.83	10.90	11.49	9.90	N/A	10.78	8.95	6.52
1984	16.53	11.28	11.82	10.29	N/A	11.01	9.52	6.59
1985	16.05	11.07	11.92	9.87	N/A	11.08	9.89	6.89
1986	16.34	11.32	12.51	9.59	N/A	11.36	10.16	7.14
1987	16.51	12.16	13.56	10.09	N/A	11.68	10.65	7.57
1988	16.13	12.60	13.91	10.71	N/A	12.14	10.74	7.82
1989	16.52	12.87	14.09	10.84	15.21	8.42	11.22	7.79
1990	16.85	12.97	13.98	10.98	15.91	8.87	11.61	8.32
1990:3	16.93	13.06	14.34	10.79	15.30	9.05	11.31	8.49
1990:4	16.65	13.01	14.09	11.02	15.88	9.01	11.96	8.34
1990:5	16.72	12.77	13.63	10.71	16.16	8.97	11.47	8.36
1990:6	16.47	12.91	13.97	10.50	15.62	9.05	11.94	8.37
1990:7	16.64	13.04	14.02	10.93	15.94	9.12	11.61	8.53
1990:8	16.88	13.47	14.51	11.27	16.58	8.85	11.06	8.31
1990:9	16.95	12.43	13.18	10.97	15.62	8.83	11.70	8.18
1990:10	16.80	12.73	13.57	11.11	16.59	8.00	11.55	8.26
1990:11	17.64	12.69	13.60	11.00	15.96	9.03	11.90	8.39
1990:12	17.44	13.07	13.83	11.52	15.93	9.01	11.88	8.39
1991:1	17.40	12.47	13.37	10.71	8.02	16.05	8.71	11.77
1991:2	16.95	12.53	13.50	10.72	8.32	15.97	9.00	11.87

* Excluding Railroads.

TAXABLE SALES and GAMING REVENUES: Clark and Washoe Counties

Year / Quarter	Clark County				Washoe County			
	TAXABLE SALES		GAMING REVENUES		TAXABLE SALES		GAMING REVENUES	
	($ 000)	Growth Rate	($ 000)	Growth Rate	($ 000)	Growth Rate	($ 000)	Growth Rate
1980	3,325,218	0.62	1,619,080	13.69	1,694,981	1.92	456,771	8.06
1981	3,637,724	9.40	1,675,219	3.47	1,713,817	1.11	508,337	11.29
1982	3,576,901	-1.67	1,751,751	4.57	1,582,927	-7.64	528,279	3.92
1983	3,798,376	6.19	1,886,758	7.71	1,645,578	3.96	585,722	10.87
1984	4,119,297	8.45	2,008,155	6.43	1,864,754	13.32	640,719	9.39
1985	4,547,519	10.40	2,232,924	11.19	2,013,287	7.97	649,410	1.36
1986	5,095,676	12.05	2,393,155	7.18	2,179,765	8.27	655,997	1.01
1987	5,672,438	11.32	2,737,999	14.41	2,278,223	4.52	700,372	6.76
1988	6,412,864	13.05	3,002,463	9.66	2,520,906	10.65	742,153	5.97
1989	7,686,354	19.86	3,295,638	9.76	2,680,937	6.35	753,865	1.58
1990	8,569,511	11.49	3,871,083	17.46	2,725,669	1.66	809,998	7.45
1989:1	1,770,989	22.99	816,979	9.46	616,365	10.03	162,625	-2.05
1989:2	1,856,915	16.94	829,956	15.03	670,021	4.36	192,743	-2.01
1989:3	1,910,493	16.65	829,318	8.25	679,569	4.39	217,679	5.02
1989:4	2,147,957	22.94	819,386	6.63	714,982	7.07	180,819	5.04
1990:1	2,021,826	14.16	971,610	18.93	604,338	-1.95	172,245	5.92
1990:2	2,196,498	18.29	949,344	14.38	700,396	4.53	213,432	10.73
1990:3	2,123,127	11.13	979,393	18.10	702,067	3.31	226,205	3.92
1990:4	2,228,060	3.73	970,736	18.47	718,868	0.54	198,115	9.57

Data Note: Annual values are sums of quarterly values.

CONSTRUCTION: Clark County
RESIDENTIAL PERMITS-PRIVATELY OWNED NEW HOUSING

Year / Month	UNITS		VALUATION		
	Total	Single Family	TOTAL ($ 000)	Single Family ($ 000)	Non-Residential ($ Million)
1980	8,005	4,106	257,418	175,042	316.6
1981	7,563	4,391	236,089	167,465	301.7
1982	6,234	3,055	187,404	126,562	169.8
1983	12,951	6,345	422,732	270,786	351.2
1984	9,571	4,575	368,456	222,572	272.7
1985	9,633	5,026	360,263	241,761	357.0
1986	11,845	7,019	522,164	383,888	444.7
1987	12,468	7,204	528,130	385,492	359.6
1988	26,446	9,884	1,036,662	546,545	419.6
1989	24,522	12,665	1,220,846	839,780	775.2
1990	20,556	11,073	1,257,354	903,971	621.1
1990:3	2,339	989	153,953	93,172	36.0
1990:4	1,865	985	156,397	110,906	N/A
1990:5	1,820	1,215	151,218	122,692	51.9
1990:6	2,055	950	102,297	67,267	53.9
1990:7	1,649	978	91,672	71,539	60.0
1990:8	2,162	1,011	109,043	79,128	72.2
1990:9	1,448	893	76,371	61,620	30.6
1990:10	1,188	868	65,783	60,432	52.9
1990:11	947	740	51,152	47,349	92.6
1990:12	988	666	57,059	46,579	N/A

Data Note: Annual values are sums of monthly values.

COUNTY ECONOMIC PROFILES

CARSON CITY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOY-MENT	UNEMPLOY-MENT	UNEMPLOY-MENT RATE	SA	TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)	CONSTRUCTION UNITS Total	Single Family
1980	32,258	1.4	16,990	1,370	7.5		218,061	32,211	N/A	138	100
1981	33,200	2.9	18,080	1,630	8.3		199,371	32,449	N/A	136	106
1982	33,930	2.2	17,970	2,360	11.6		188,009	33,011	N/A	94	60
1983	34,430	1.5	18,410	2,320	11.2		223,612	34,736	N/A	230	201
1984	34,750	0.9	17,650	1,740	9.0		257,041	39,300	27.1	202	193
1985	35,400	1.9	18,870	1,840	8.9		280,183	39,211	24.5	322	248
1986	36,040	1.8	19,560	1,230	5.9		310,847	38,534	27.3	494	430
1987	36,650	1.7	20,030	1,360	6.4		331,413	35,664	27.9	411	343
1988	37,450	2.2	20,770	1,120	5.1		367,594	37,005	30.5	341	321
1989	39,420	5.3	20,690	1,250	5.7		409,327	38,585	31.2	464	378
1990	40,340	2.3	20,630	1,170	5.4		416,819	39,995	2.6		
1990:3			20,190	1,290	6.0	5.3	91,897	8,203	2.0		
1990:4			20,440	1,090	5.1	4.8			2.1		
1990:5			20,670	1,070	4.9	5.3			2.8		
1990:6			20,980	1,120	5.1	5.9	105,944	10,555	3.5		
1990:7			21,160	1,090	4.9	5.7			3.7		
1990:8			20,890	910	4.2	4.9			4.6		
1990:9			20,910	980	4.5	5.4	110,289	11,637	4.0		
1990:10			20,850	1,140	5.2	6.0			3.2		
1990:11			20,840	1,170	5.3	5.4			1.5		
1990:12			20,720	1,370	6.2	5.6	108,689	9,600	0.8		
1991:1			20,480	1,660	7.5	5.6			1.2		
1991:2			20,930	1,540	6.8	5.3					
1991:3								8,474			

• Figures available on a quarterly basis.

CHURCHILL COUNTY Profile:

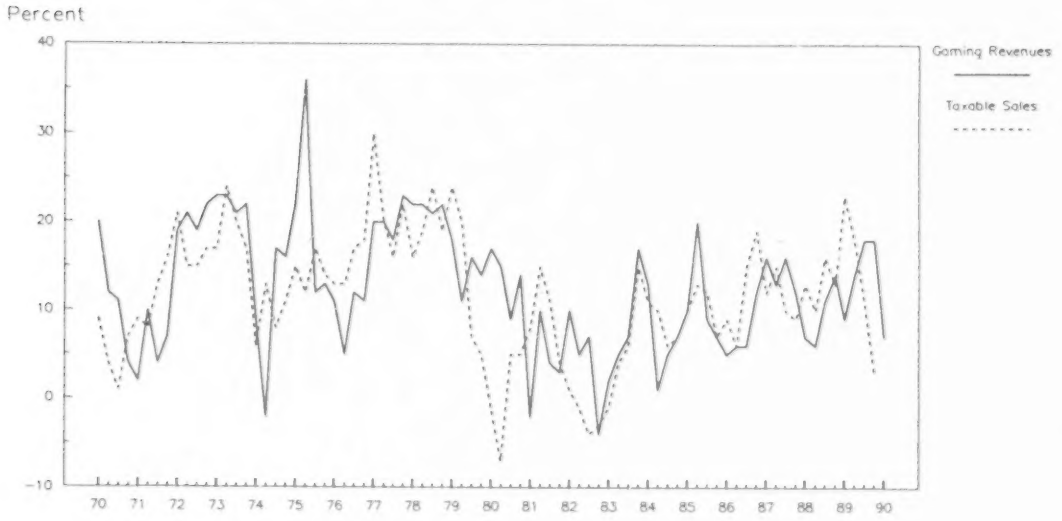
Year/ Month	POPULATION Residents	% Chg	EMPLOY-MENT	UNEMPLOY-MENT	UNEMPLOY-MENT RATE	SA	TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)	CONSTRUCTION UNITS Total	Single Family
1980	14,038	3.2	5,310	390	6.8		63,443	N/A	N/A	248	80
1981	14,520	3.4	5,560	510	8.3		58,750	N/A	N/A	53	48
1982	14,630	0.8	5,690	900	13.6		56,945	3,941	N/A	31	19
1983	14,800	1.2	5,780	900	13.5		63,650	4,548	N/A	57	41
1984	15,050	1.7	5,830	680	10.4		75,396	4,472	5.0	94	75
1985	15,450	2.7	6,440	720	10.1		89,477	5,488	5.6	127	66
1986	15,800	2.3	6,690	510	7.1		92,578	5,981	6.2	171	106
1987	17,460	10.5	7,420	610	7.6		110,825	6,878	7.1	249	125
1988	18,600	6.5	8,030	520	6.1		120,138	7,597	7.8	127	83
1989	19,090	2.6	7,760	570	6.9		118,625	7,803	8.7	116	87
1990	19,230	0.7	7,630	500	6.2		145,206	8,058	0.9		
1990:3			7,550	550	6.7	5.8	28,109	1,935	0.8		
1990:4			7,820	450	5.5	5.6			0.9		
1990:5			7,850	470	5.6	6.2			1.0		
1990:6			8,010	520	6.1	6.9	28,495	2,119	1.1		
1990:7			7,940	450	5.4	6.1			1.0		
1990:8			7,740	420	5.2	6.5			0.9		
1990:9			7,610	400	5.0	5.8	48,043	2,086	1.0		
1990:10			7,440	460	5.9	6.8			1.0		
1990:11			7,330	550	7.0	7.3			0.6		
1990:12			7,380	600	7.5	7.3	40,559	1,918	0.6		
1991:1			7,270	700	8.8	6.5			0.5		
1991:2			7,480	620	7.6	5.6					
1991:3								2,089			

• Figures available on a quarterly basis.

GROSS GAMING REVENUES VS TAXABLE SALES

Clark County

Percent Change from Year-Ago-Quarter



CLARK COUNTY Profile:

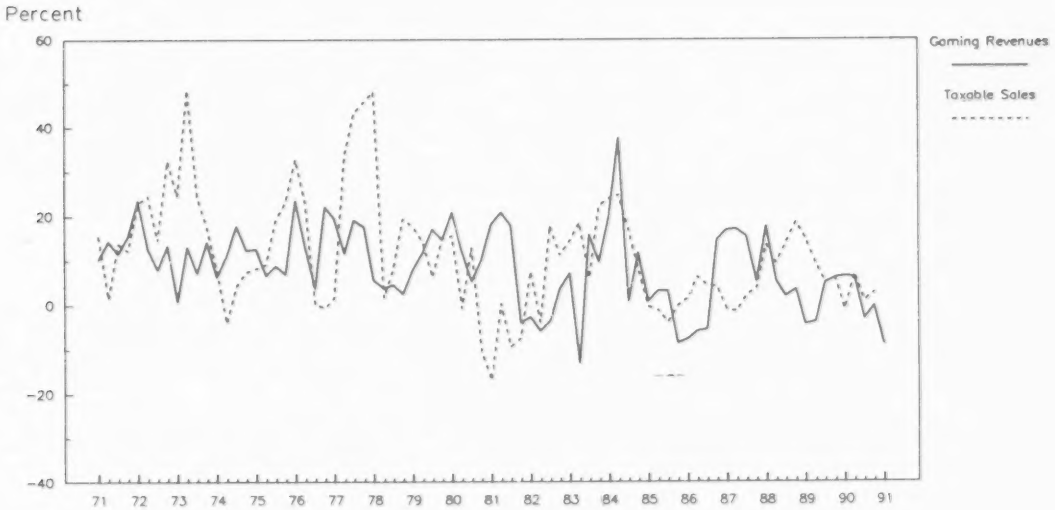
Year/ Month	POPULATION Residents	% Chg	EMPLOY-MENT	UNEMPLOY-MENT	UNEMPLOY-MENT RATE SA		TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)	CONSTRUCTION UNITS Total	Single Family
1980	469,362	6.3	– 221,500	16,200	6.8		3,325,218	1,619,080	N/A	8,005	4,106
1981	494,460	5.3	237,300	20,400	7.9		3,637,724	1,675,219	N/A	7,563	4,391
1982	511,930	3.5	240,000	29,400	10.9		3,576,901	1,751,751	N/A	6,234	3,055
1983	531,210	3.8	244,000	28,100	10.3		3,798,376	1,886,758	N/A	12,951	6,345
1984	546,580	2.9	260,300	24,100	8.5		4,119,297	2,008,155	1,683.8	9,571	4,575
1985	572,140	4.7	270,900	25,400	8.6		4,547,519	2,232,924	1,899.4	9,633	5,026
1986	600,160	4.9	286,200	19,100	6.3		5,095,676	2,393,155	2,152.8	11,845	7,019
1987	631,920	5.3	303,600	21,000	6.5		5,672,438	2,737,999	2,424.6	12,468	7,204
1988	659,830	4.4	323,600	18,400	5.4		6,412,864	3,002,463	2,728.0	26,446	9,884
1989	733,180	11.1	342,000	17,800	5.0		7,686,354	3,295,638	2,829.1	24,495	12,677
1990	800,840	9.2	366,300	19,000	4.9		8,569,511	3,871,083	3,458.2		
1990:3			360,700	17,300	4.6	4.5	2,021,826	971,610	273.3		
1990:4			358,600	17,700	4.7	4.8			337.8		
1990:5			358,300	19,200	5.1	5.4			301.7		
1990:6			363,500	19,900	5.2	5.2	2,196,498	949,344	283.7		
1990:7			369,600	19,400	5.0	4.9			273.4		
1990:8			370,300	18,600	4.8	4.8			290.1		
1990:9			372,500	18,600	4.8	5.0	2,123,127	979,393	282.5		
1990:10			374,400	21,200	5.4	5.6			325.7		
1990:11			378,400	20,900	5.2	5.5			326.7		
1990:12			375,100	22,800	5.7	5.4	2,228,060	970,736	223.0		
1991:1			375,700	23,800	6.0	5.7			238.7		
1991:2			380,900	24,500	6.0	5.9					
1991:3								1,047,296			

* Figures available on a quarterly basis.

GROSS GAMING REVENUES VS TAXABLE SALES

Douglas County

Percent Change from Year-Ago-Quarter



DOUGLAS COUNTY Profile:

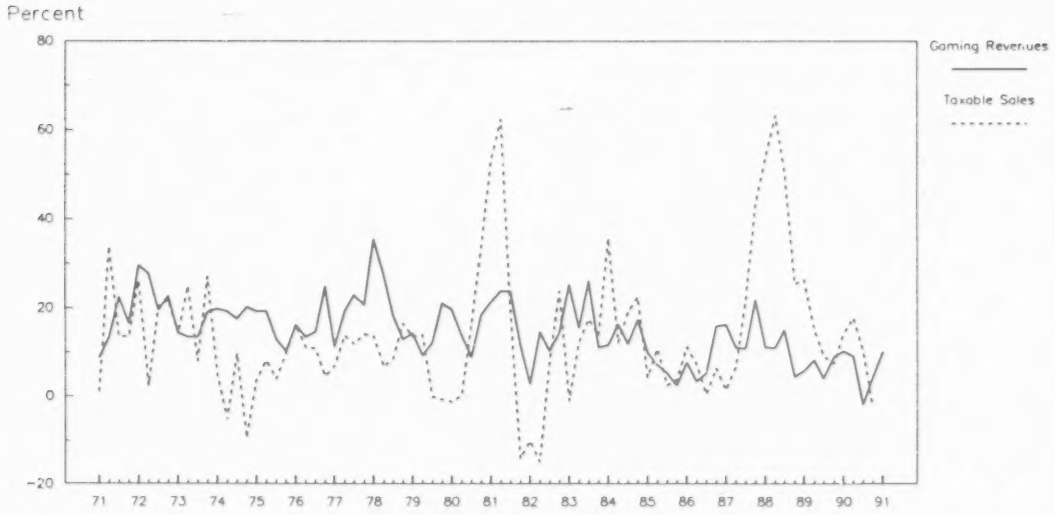
Year / Month	POPULATION Residents		EMPLOY-MENT %Chg	UNEMPLOY-MENT SA	UNEMPLOY-MENT RATE ($ 000)		TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX Total	CONSTRUCTION UNITS Single Family	
1980	19,573	6.4	7,970	630	7.3		168,853	212,606	N/A	630	307
1981	20,180	3.1	8,010	790	9.0		154,601	241,932	N/A	N/A	N/A
1982	20,920	3.7	8,100	900	10.0		167,772	235,899	N/A	166	166
1983	21,500	2.8	8,150	920	10.2		192,076	248,916	N/A	254	244
1984	22,250	3.5	11,660	710	5.7		227,039	285,802	143.2	462	370
1985	23,200	4.3	12,340	840	6.4		223,621	286,564	154.9	390	336
1986	24,250	4.5	12,400	760	5.8		233,013	280,250	171.6	411	327
1987	25,200	3.9	11,730	830	6.6		235,260	319,451	193.5	341	304
1988	26,110	3.6	11,830	680	5.5		267,690	340,664	214.8	550	520
1989	30,410	16.5	12,000	660	5.2		290,561	343,657	222.7		
1990	32,130	5.7	11,780	660	5.3		298,398	350,522	19.1		
1990:3			11,530	740	6.0	5.7	• 67,519	• 84,108	22.3		
1990:4			11,660	690	5.6	5.0			11.8		
1990:5			11,610	660	5.3	5.3			19.4		
1990:6			12,130	650	5.1	5.8	75,518	87,101	19.4		
1990:7			12,550	620	4.7	6.0			19.7		
1990:8			12,370	530	4.1	5.2			24.2		
1990:9			12,050	510	4.1	5.1	84,435	107,985	20.6		
1990:10			11,730	610	4.9	5.5			27.3		
1990:11			11,480	720	5.9	5.5			14.9		
1990:12			11,310	810	6.7	5.7	70,926	71,328	15.2		
1991:1			11,010	880	7.4	5.8			11.0		
1991:2			11,170	800	6.7	5.5					
1991:3								76,796			

• Figures available on a quarterly basis.

GROSS GAMING REVENUES VS TAXABLE SALES

Elko County

Percent Change from Year-Ago-Quarter



ELKO COUNTY Profile:

Year / Month	POPULATION Residents	%Chg	EMPLOY-MENT	UNEMPLOY-MENT	UNEMPLOY-MENT RATE SA		TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)	CONSTRUCTION UNITS Total	Single Family
1980	17,573	9.1	10,060	510	4.8		109,505	37,636	N/A	197	165
1981	18,790	6.9	11,480	640	5.2		137,564	45,335	N/A	290	124
1982	19,760	5.2	11,990	1,110	8.5		137,883	50,204	N/A	157	135
1983	20,770	5.1	12,330	1,070	8.0		153,729	60,079	N/A	253	123
1984	21,830	5.1	11,320	840	6.9		186,347	68,634	58.3	361	103
1985	22,850	4.7	11,880	950	7.4		196,169	72,903	58.6	257	87
1986	23,920	4.7	11,900	780	6.1		207,908	78,433	61.2	101	87
1987	25,000	4.5	12,280	830	6.3		248,059	89,945	71.3	281	153
1988	26,790	7.2	13,730	690	4.8		362,708	99,498	93.0	390	243
1989	33,270	24.2	14,560	800	5.2		411,720	106,145	99.3	758	540
1990	36,260	9.0	14,840	770	4.9		452,378	111,568	8.2		
1990:3			14,140	880	5.9	4.9	• 98,821	• 26,107	8.8		
1990:4			14,660	740	4.8	4.9			6.0		
1990:5			14,820	700	4.5	5.2			7.2		
1990:6			15,310	680	4.3	4.7	126,973	29,805	10.4		
1990:7			15,720	800	4.8	6.1			12.0		
1990:8			15,680	580	3.5	4.5			9.7		
1990:9			15,560	590	3.6	4.8	123,195	29,953	13.1		
1990:10			15,210	700	4.4	4.8			7.6		
1990:11			14,880	740	4.7	4.8			5.8		
1990:12			14,650	980	6.3	5.4	103,389	25,703	6.6		
1991:1			14,540	990	6.4	4.7			4.9		
1991:2			14,910	910	5.7	4.3					
1991:3								28,761			

• Figures available on a quarterly basis.

ESMERALDA COUNTY Profile:

Year/ Month	POPULATION Residents	% Chg	EMPLOYMENT	UNEMPLOYMENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)
1980	842	5.3	220	20	8.2		2,273
1981	1,100	30.6	360	30	7.9		2,809
1982	1,200	9.1	410	60	13.3		3,970
1983	1,330	10.8	360	80	17.4		8,235
1984	1,490	12.0	810	60	6.7		8,561
1985	1,380	-7.4	710	50	7.0		7,522
1986	1,380	0.0	700	40	5.1		7,209
1987	1,380	0.0	650	50	7.1		6,974
1988	1,440	4.3	730	50	6.3		6,463
1989	1,240	-13.9	640	40	5.6		6,777
1990	1,230	-0.8	570	40	6.5		5,784
1990:3			650	40	6.0	6.0	* 1,730
1990:4			620	40	6.2	6.2	
1990:5			620	50	7.4	7.4	
1990:6			560	40	6.7	6.7	1,419
1990:7			550	40	6.3	6.3	
1990:8			550	30	5.4	5.4	
1990:9			550	30	5.8	5.8	1,631
1990:10			550	40	6.6	6.6	
1990:11			550	40	6.0	6.0	
1990:12			540	30	5.7	5.7	1,004
1991:1			530	30	5.6	5.6	
1991:2			560	30	5.8	5.8	

* Figures available on a quarterly basis.
Data Note: Gaming Revenues and Construction figures not available

EUREKA COUNTY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOYMENT	UNEMPLOYMENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)
1980	1,208	20.8	660	30	5.0		8,564
1981	1,250	3.5	700	40	5.3		8,243
1982	1,250	0.0	670	110	14.2		6,264
1983	1,270	1.6	690	70	9.8		11,107
1984	1,350	6.3	850	50	5.7		19,957
1985	1,450	7.4	1,110	70	5.9		30,074
1986	1,530	5.5	1,180	50	4.1		18,390
1987	1,950	27.5	1,400	40	2.6		37,150
1988	2,010	3.1	2,800	50	1.8		83,935
1989	2,050	2.0	3,180	70	2.3		98,792
1990	2,110	2.9	3,270	60	1.9		N/A
1990:3			3,170	70	2.1	2.1	* 23,192
1990:4			3,270	70	2.1	2.1	
1990:5			3,190	50	1.5	1.6	
1990:6			3,230	80	2.3	2.4	22,291
1990:7			3,420	60	1.7	1.8	
1990:8			3,380	30	0.9	1.0	
1990:9			3,380	40	1.2	1.2	18,890
1990:10			3,350	60	1.8	1.7	
1990:11			3,300	80	2.3	2.2	
1990:12			3,310	70	2.1	2.0	N/A
1991:1			3,280	80	2.4	2.3	
1991:2			3,340	50	1.4	1.3	

* Figures available on a quarterly basis.
Data Note: Gaming Revenues, Room Tax and Construction figures not available

HUMBOLDT COUNTY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOYMENT	UNEMPLOYMENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)	CONSTRUCTION UNITS Total	Single Family
1980	9,699	12.8	5,170	220	4.2		62,455	7,492	N/A	117	117
1981	10,700	10.3	5,690	310	5.2		62,873	8,588	N/A	88	64
1982	11,430	6.8	5,210	600	10.3		66,833	8,051	N/A	67	67
1983	11,480	0.4	5,170	660	11.3		100,169	8,829	N/A	26	22
1984	11,790	2.7	5,060	510	9.1		90,695	8,630	20.4	8	8
1985	11,880	0.8	4,940	490	9.1		137,583	8,226	21.5	10	4
1986	11,820	-0.5	4,840	380	7.3		117,243	8,280	22.0	34	34
1987	12,180	3.0	5,400	360	6.2		142,639	9,833	26.7	25	25
1988	12,940	6.2	6,330	280	4.3		183,069	11,342	32.3	120	53
1989	13,650	5.5	6,660	380	5.3		208,738	11,697	33.7	49	39
1990	14,270	4.5	6,520	340	5.0		N/A	11,559	3.0		
1990:3			6,300	400	6.0	5.2	• 54,910	• 2,439	2.1		
1990:4			6,450	340	5.0	5.2			2.5		
1990:5			6,580	350	5.0	5.1			3.1		
1990:6			6,870	310	4.3	5.3	57,282	3,319	4.3		
1990:7			6,880	310	4.3	5.5			4.5		
1990:8			6,830	290	4.1	5.0			4.8		
1990:9			6,770	270	3.8	4.7	61,401	2,981	3.6		
1990:10			6,580	350	5.0	5.3			3.3		
1990:11			6,400	300	4.5	4.7			2.4		
1990:12			6,370	340	5.1	4.4	N/A	2,820	2.0		
1991:1			6,330	390	5.8	4.2			1.8		
1991:2			6,540	340	4.9	3.6					
1991:3								2,488			

• Figures available on a quarterly basis.

LANDER COUNTY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOYMENT	UNEMPLOYMENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)	ROOM TAX ($ 000)
1980	4,257	18.3	2,250	90	3.9		31,903	N/A
1981	4,980	17.0	2,520	110	4.1		27,748	N/A
1982	4,970	-0.2	2,290	240	9.5		29,241	N/A
1983	4,700	-5.4	2,020	280	12.2		38,493	N/A
1984	4,570	-2.8	1,950	160	7.4		39,069	5.6
1985	4,500	-1.5	1,990	180	8.1		33,820	3.2
1986	4,490	-0.2	1,890	200	9.4		36,999	3.9
1987	4,580	2.0	2,330	150	6.0		50,618	5.3
1988	4,960	8.3	2,780	140	4.9		65,675	6.1
1989	6,190	24.8	3,070	190	5.9		88,375	6.1
1990	6,340	2.4	2,880	190	6.1		N/A	0.5
1990:3			2,710	250	8.6	6.9	• 25,023	0.3
1990:4			2,800	210	6.9	6.5		0.4
1990:5			2,820	150	4.9	5.3		0.5
1990:6			2,960	180	5.7	6.1	25,477	0.6
1990:7			3,010	170	5.2	6.5		0.7
1990:8			3,010	160	5.1	6.6		0.7
1990:9			2,980	130	4.0	4.8	24,496	0.7
1990:10			2,940	180	5.9	6.6		0.7
1990:11			2,910	150	4.8	4.7		0.5
1990:12			2,910	160	5.1	4.8	N/A	0.4
1991:1			2,960	190	6.0	4.9		0.4
1991:2			3,010	190	5.9	4.6		

• Figures available on a quarterly basis.
Data Note: Construction figures not available

LINCOLN COUNTY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOYMENT	UNEMPLOYMENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)	ROOM TAX ($ 000)
1980	3,786	5.2	1,840	90	4.5		9,162	N/A
1981	4,000	5.7	2,300	140	5.9		8,211	N/A
1982	4,130	3.3	2,480	340	12.0		9,137	N/A
1983	4,060	-1.7	2,340	230	8.8		8,817	N/A
1984	4,110	1.2	2,100	140	6.4		9,024	0.4
1985	4,200	2.2	2,060	150	6.7		9,068	0.4
1986	4,200	0.0	2,030	120	5.6		7,529	0.5
1987	4,250	1.2	2,120	130	5.9		8,276	0.6
1988	4,280	0.7	2,090	100	4.6		10,078	1.0
1989	4,330	1.2	2,020	110	5.3		11,097	1.4
1990	4,430	2.3	1,970	110	5.1		N/A	0.1
1990:3			1,930	130	6.4	6.5	• 2,204	0.1
1990:4			1,980	140	6.4	6.5		0.1
1990:5			1,960	90	4.2	4.8		0.1
1990:6			2,000	110	5.1	6.1	3,252	0.1
1990:7			2,010	80	4.0	4.3		0.1
1990:8			1,980	80	3.8	4.1		0.1
1990:9			1,980	80	4.0	3.8	3,036	0.1
1990:10			1,960	100	4.9	5.5		0.2
1990:11			1,940	100	5.1	4.5		0.2
1990:12			1,950	110	5.3	5.0	N/A	0.0
1991:1			1,940	140	6.6	5.6		0.1
1991:2			1,990	100	4.6	4.1		

• Figures available on a quarterly basis.
Data Note: Gaming Revenues, and Construction figures not available.

LYON COUNTY Profile:

Year/ Month	POPULATION Residents	% Chg	EMPLOYMENT	UNEMPLOYMENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)
1980	13,735	10.8	3,890	320	7.6		44,804
1981	14,300	4.1	4,350	410	8.6		46,412
1982	14,850	3.8	4,690	690	12.8		44,023
1983	15,450	4.0	4,780	680	12.5		44,599
1984	16,200	4.9	8,100	610	7.0		52,811
1985	17,050	5.2	8,640	790	8.4		57,761
1986	17,950	5.3	9,380	670	6.6		63,109
1987	19,750	10.0	9,610	750	7.2		72,175
1988	20,900	5.8	10,980	620	5.3		78,479
1989	21,750	4.1	11,070	710	6.0		85,985
1990	22,280	2.4	11,430	670	5.5		N/A
1990:3			10,980	760	6.5	5.5	• 17,599
1990:4			11,370	630	5.3	5.1	
1990:5			11,520	620	5.1	5.5	
1990:6			11,780	620	5.0	5.3	23,898
1990:7			11,940	610	4.9	5.8	
1990:8			11,810	540	4.3	5.4	
1990:9			11,730	580	4.7	5.8	22,285
1990:10			11,590	640	5.2	6.1	
1990:11			11,460	670	5.5	5.7	
1990:12			11,470	780	6.4	5.9	N/A
1991:1			11,440	960	7.7	5.7	
1991:2			11,630	890	7.1	5.3	

• Figures available on a quarterly basis.
Data Note: Gaming Revenues, Room Tax, and Construction figures not available.

MINERAL COUNTY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOYMENT	UNEMPLOYMENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)
1980	6,237	2.2	2,970	110	3.7		17,352	N/A	N/A
1981	6,300	1.0	3,250	160	4.8		17,970	N/A	N/A
1982	6,250	-0.8	3,220	300	8.4		17,429	N/A	N/A
1983	6,150	-1.6	3,430	270	7.4		20,782	N/A	N/A
1984	6,030	-2.0	2,850	220	7.1		26,128	N/A	4.5
1985	6,030	0.0	2,820	270	8.9		25,410	N/A	4.6
1986	6,130	1.7	2,800	210	7.0		27,202	N/A	4.8
1987	6,470	5.5	2,770	200	6.9		36,488	N/A	5.2
1988	6,650	2.8	2,940	150	4.9		42,821	N/A	6.3
1989	7,440	11.9	2,900	170	5.4		46,102	N/A	5.9
1990	7,700	3.5	2,820	160	5.3		N/A	N/A	0.5
1990:3			2,860	200	6.4	6.4	* 10,566	N/A	0.5
1990:4			2,780	150	5.0	4.8			0.5
1990:5			2,780	160	5.5	5.0			0.5
1990:6			2,830	160	5.4	5.8	14,907	N/A	0.6
1990:7			2,860	130	4.5	5.2			0.6
1990:8			2,820	130	4.3	4.6			0.6
1990:9			2,800	110	3.9	4.5	11,647	N/A	0.6
1990:10			2,790	160	5.5	5.8			0.5
1990:11			2,780	180	6.2	5.5			0.4
1990:12			2,770	170	5.7	5.4	N/A	N/A	0.3
1991:1			2,580	160	5.9	5.4			0.3
1991:2			2,740	140	5.0	4.4			

* Figures available on a quarterly basis.
Data Note: Construction figures not available.

NYE COUNTY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOYMENT	UNEMPLOYMENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)
1980	9,458	15.3	2,470	110	4.2		55,395	3,111	N/A
1981	11,100	17.4	2,960	140	4.6		63,974	4,299	N/A
1982	13,240	19.3	3,220	280	8.0		77,983	4,552	N/A
1983	13,700	3.5	3,350	290	8.0		65,423	4,615	N/A
1984	14,850	8.4	6,180	280	4.4		75,487	5,299	11.0
1985	14,850	0.0	6,590	440	6.2		77,251	5,766	11.8
1986	14,970	0.8	6,720	430	6.1		74,159	6,562	11.8
1987	15,520	3.7	6,850	410	5.7		162,420	N/A	15.0
1988	16,170	4.2	7,280	350	4.6		194,440	N/A	18.1
1989	17,980	11.2	7,380	360	4.6		200,854	11,257	20.9
1990	18,650	3.7	7,170	360	4.7		N/A	12,491	1.6
1990:3			7,150	340	4.5	4.7	* 37,720	* 3,101	1.6
1990:4			7,240	330	4.3	4.1			1.7
1990:5			7,110	390	5.2	5.3			2.1
1990:6			7,300	350	4.6	4.5	42,977	3,227	1.6
1990:7			7,270	410	5.3	5.4			1.8
1990:8			7,120	320	4.3	4.7			1.6
1990:9			7,270	340	4.5	4.4	41,840	2,981	1.7
1990:10			7,100	390	5.2	5.2			1.9
1990:11			7,080	370	4.9	4.7			1.5
1990:12			7,260	390	5.1	5.2	N/A	3,182	1.1
1991:1			7,130	360	4.8	4.5			1.3
1991:2			7,160	380	5.1	4.9			
1991:3							3,319		

* Figures available on a quarterly basis.
Data Note: Construction figures not available.

PERSHING COUNTY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOY-MENT	UNEMPLOY-MENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)	ROOM TAX ($ 000)
1980	3,448	11.2	1,490	70	4.8		12,545	N/A
1981	3,610	4.7	1,950	110	5.3		12,590	N/A
1982	3,720	3.0	1,880	130	6.5		14,046	N/A
1983	3,710	-0.3	1,640	100	6.0		14,120	N/A
1984	3,650	-1.6	1,720	90	4.9		15,217	2.6
1985	3,610	-1.1	1,730	110	5.8		15,792	2.8
1986	3,580	-0.8	2,010	90	4.3		29,205	4.7
1987	4,360	21.8	2,140	90	3.9		31,279	4.8
1988	4,590	5.3	2,610	80	3.1		37,383	5.2
1989	4,820	5.0	2,560	100	3.8		39,562	5.3
1990	4,970	3.1	2,560	110	4.0		N/A	0.4
1990:3			2,530	110	4.1	3.3	* 8,069	0.3
1990:4			2,620	90	3.5	3.9		0.3
1990:5			2,520	100	3.8	4.8		0.5
1990:6			2,700	110	3.9	4.5	9,376	0.7
1990:7			2,690	90	3.3	4.0		0.7
1990:8			2,650	80	3.0	4.2		0.6
1990:9			2,620	90	3.5	5.0	11,300	0.4
1990:10			2,550	80	3.2	2.9		0.3
1990:11			2,490	120	4.6	4.7		0.3
1990:12			2,490	120	4.4	3.8	N/A	0.2
1991:1			2,490	120	4.6	3.1		0.1
1991:2			2,570	100	3.8	2.6		

* Figures available on a quarterly basis.
Data Note: Gaming Revenues, and Construction figures not available.

STOREY COUNTY Profile:

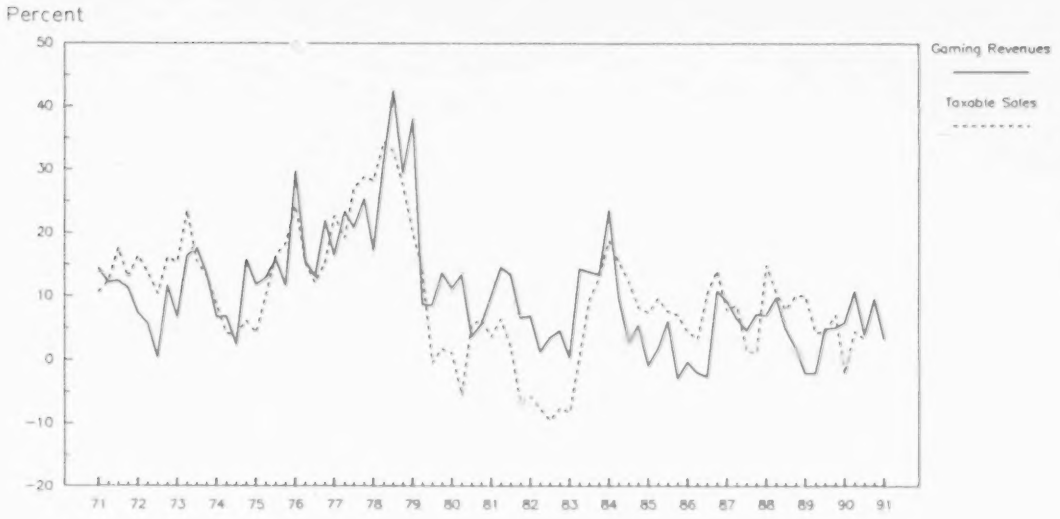
Year / Month	POPULATION Residents	% Chg	EMPLOY-MENT	UNEMPLOY-MENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)
1980	1,520	16.9	1,140	50	4.1		14,028	N/A	N/A
1981	1,590	4.6	1,270	100	7.5		9,054	N/A	N/A
1982	1,690	6.3	1,110	170	13.0		7,136	N/A	N/A
1983	1,730	2.4	1,150	230	16.5		7,753	N/A	N/A
1984	1,780	2.9	990	190	15.8		9,650	N/A	N/A
1985	1,850	3.9	830	100	10.6		10,880	N/A	N/A
1986	1,960	5.9	780	50	6.6		13,615	N/A	1.1
1987	2,130	8.7	840	60	6.2		13,688	N/A	1.5
1988	2,270	6.6	830	60	6.2		18,783	N/A	1.7
1989	2,480	9.3	910	50	5.1		16,961	2,618	1.9
1990	2,560	3.2	920	40	4.3		N/A	2,512	0.1
1990:3			840	60	7.0	6.1	* 2,390	* 373	0.1
1990:4			920	50	4.9	4.5			0.2
1990:5			950	30	3.4	3.6			0.1
1990:6			1,000	30	2.5	3.1	4,323	760	0.1
1990:7			1,020	30	2.8	3.9			0.2
1990:8			1,010	30	2.8	3.8			0.2
1990:9			990	30	3.1	3.9	5,525	835	0.2
1990:10			930	30	3.1	3.5			0.1
1990:11			900	60	5.9	4.9			0.1
1990:12			880	40	4.8	3.7	N/A	544	0.1
1991:1			840	30	3.4	2.5			0.2
1991:2			860	40	4.7	3.3			
1991:3								355	

* Figures available on a quarterly basis.
Data Note: Construction figures not available.

GROSS GAMING REVENUES VS TAXABLE SALES

Washoe County

Percent Change from Year-Ago-Quarter



WASHOE COUNTY Profile:

Year / Month	POPULATION Residents	% Chg	EMPLOY-MENT	UNEMPLOY-MENT	UNEMPLOYMENT RATE	SA	TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)
1980	195,222	4.3	115,400	6,500	5.4		1,694,981	456,771	N/A
1981	201,620	3.3	120,100	7,100	5.6		1,713,817	508,337	N/A
1982	204,800	1.6	121,500	10,900	8.2		1,582,927	528,279	N/A
1983	210,590	2.8	121,000	11,100	8.4		1,645,578	585,722	N/A
1984	218,190	3.6	120,000	8,000	6.2		1,864,754	640,719	543.4
1985	224,420	2.9	123,600	9,100	6.8		2,013,287	649,410	574.0
1986	231,780	3.3	127,200	7,000	5.2		2,179,765	655,997	600.8
1987	236,480	2.0	129,300	7,800	5.7		2,278,223	700,372	651.4
1988	242,800	2.7	132,800	6,500	4.6		2,520,906	742,153	713.5
1989	251,130	3.4	130,400	6,500	4.7		2,680,937	753,865	718.2
1990	256,640	2.2	129,300	6,500	4.8		N/A	809,998	62.9
1990:3			127,800	6,900	5.1	4.6	• 604,338	• 172,245	64.3
1990:4			128,000	6,200	4.6	4.6			61.4
1990:5			127,600	6,300	4.7	5.1			68.6
1990:6			129,500	6,100	4.5	5.0	700,396	213,432	69.3
1990:7			130,600	6,000	4.4	5.0			76.0
1990:8			130,200	5,400	4.0	4.5			81.5
1990:9			130,300	5,200	3.8	4.5	702,067	226,205	79.9
1990:10			131,200	6,300	4.6	5.2			69.6
1990:11			130,800	6,800	5.0	5.1			47.7
1990:12			130,400	7,900	5.7	5.1	N/A	198,115	43.3
1991:1			128,800	8,800	6.4	5.0			39.0
1991:2			130,800	8,300	6.0	4.9			
1991:3								178,075	

• Figures available on a quarterly basis.

Data Note: Construction figures not available.

WHITE PINE COUNTY Profile:

Year/ Month	POPULATION Residents	% Chg	EMPLOY-MENT	UNEMPLOY-MENT	UNEMPLOY-MENT RATE	SA	TAXABLE SALES ($ 000)	GAMING REVENUES ($ 000)	ROOM TAX ($ 000)
1980	8,286	2.3	3,650	230	6.0		46,000	N/A	N/A
1981	8,760	5.7	4,080	290	6.7		47,943	N/A	N/A
1982	8,680	-0.9	3,590	610	14.4		40,198	N/A	N/A
1983	7,820	-9.9	3,380	770	18.5		39,985	N/A	N/A
1984	7,660	-2.0	3,570	650	15.3		43,689	N/A	8.6
1985	7,560	-1.3	3,550	550	13.5		45,786	N/A	9.1
1986	7,800	3.2	3,660	340	8.4		43,888	N/A	8.4
1987	7,950	1.9	3,600	310	7.9		50,765	N/A	10.4
1988	8,090	1.8	3,850	260	6.3		65,054	N/A	12.5
1989	8,830	9.1	4,190	240	5.4		88,062	2,466	13.7
1990	10,040	13.7	4,390	290	6.2		N/A	2,924	1.1
1990:3			4,290	260	5.8	5.5	* 16,250	* 637	1.0
1990:4			4,460	230	4.9	4.7			1.0
1990:5			4,400	250	5.4	5.4			1.1
1990:6			4,440	290	6.1	6.4	18,758	790	1.7
1990:7			4,560	380	7.6	8.1			1.5
1990:8			4,530	320	6.5	7.0			1.5
1990:9			4,500	280	5.9	6.2	18,664	821	1.6
1990:10			4,390	300	6.4	6.5			1.3
1990:11			4,360	300	6.4	6.5			0.8
1990:12			4,270	330	7.1	6.9	N/A	676	0.9
1991:1			4,190	400	8.8	8.2			0.6
1991:2			4,310	430	9.1	8.5			
1991:3								687	

* Figures available on a quarterly basis.
Data Note: Construction figures not available.

Data Sources

The data sources are numerous. The majority of Nevada data was obtained in cooperation with the following: Airport Authority of Washoe County; Carson City Department of Public Works; Churchill County; City of Elko; City of Las Vegas, Nevada Building and Safety; City of North Las Vegas; City of Reno, Building and Safety Department; City of Sparks; Clark County Department of Aviation; Las Vegas Convention/Visitors Authority; Nevada Power Company; Reno-Sparks Convention/Visitors Authority; State of Nevada Department of Taxation; State of Nevada Department of Transportation; State of Nevada Employment Security Department; State of Nevada Gaming Control Board; State of Nevada Health Division; State of Nevada Office of the Demographer; U.S. Bureau of the Census; U.S. Department of Commerce; U.S. Bureau of Labor Statistics; Washoe County Building and Safety Division; and White Pine County Regional Planning Commission.

The majority of data within the Economic Indicators section of this issue is self-explanatory; however, there are three considerations to bear in mind. First, monthly and quarterly percentage changes are calculated using the corresponding month or quarter in the previous year unless otherwise noted. Second, data that was either obtained in a seasonally adjusted form or that was seasonally adjusted by the Bureau of Business and Economic Research is labeled "SA." All other data should be regarded as unadjusted for seasonal variation. Third, annual values are averages of the monthly or quarterly values unless otherwise noted.

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